AV COMMUNICATION REVIEW

AUDIO VISUAL

Rensis Likert — A Neglected Factor in Communications

Lewis V. Peterson
Wilbur Schramm — How Accurately Are Different Kinds of Graphs Read?

UNESCO — The Mass Communication Program in UNESCO

E. G. Sherburne, Jr. — Color Television and Educational TV

Robert W. Wagner — The Teaching Film of Tomorrow

Departments

- Book Reviews
- Film Reviews
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- Research Abstracts

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VOLUME II, NUMBER 3 SUMMER, 1954

CONTENTS

Articles

- A NEGLECTED FACTOR IN COMMUNICATIONS 163
  RENSIS LIKERT
- HOW ACCURATELY ARE DIFFERENT KINDS OF GRAPHS READ? 178
  LEWIS V. PETERSON
  WILBUR SCHRAMM
- THE MASS COMMUNICATION PROGRAM IN UNESCO 190
- COLOR TELEVISION AND EDUCATIONAL TV 208
  E. G. SHERBURNE, JR.
- THE TEACHING FILM OF TOMORROW 216
  ROBERT W. WAGNER

Book Reviews

- VERNON, M. D. *A Further Study of Visual Perception* ... 220
  Reviewed by Franklin Fearing

Film Reviews

- *Motion Picture Production in Universities and Colleges* 224
  Robert W. Wagner

World Communications

- *Moving Knowledge Around the World* 231
  Gerald F. Winfield

Research Abstracts

- *Visual Principles for Training by Television.* Robert Jackson 238
- *Learning from Kinescopes and Films.* Robert Jackson 239
- *What Makes for Readable Writing and Reading Success.* University of Illinois, Division of Communications 240

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A NEGLECTED FACTOR IN COMMUNICATIONS

•RENSIS LIKERT

Drawing upon the concept of the "life-space" of individuals as developed by Kurt Lewin, the author illustrates the importance of "knowing" the target audience for any kind of audio-visual communication. He points out that many audio-visual materials would have doubled effectiveness if sample interview surveys were made prior to their production in an effort to learn what is in the psychological environment of the intended audience. Rensis Likert is Director of the Institute for Social Research at the University of Michigan. This paper is based on an address presented at the 1954 Convention of the DAVI in Chicago on March 3, 1954.

AUDIO-VISUAL methods have already demonstrated their great capacity to improve substantially the effectiveness of educational activities. The achievements have been significant. But I am sure that the possibilities are far greater than we have realized, and that we will see very rapid and important developments in audio-visual instruction in the years that lie immediately ahead.

To obtain the maximum results in any audio-visual undertaking, three conditions must be fulfilled. These are:

1. It is necessary to use the most appropriate media.
2. It is necessary to use good technical skill in the utilization of the selected media.
3. It is essential to use content that produces a sufficient impact upon a target audience to achieve the desired instructional objective.

It is on this third point that I should like to concentrate my comments. There are two reasons for this choice. First, relatively little attention is being given to the matching of content to the target audience. Second, there are indications that research on

audience interests and motives has great potentiality for increasing the effectiveness of educational material. These indications suggest it may be possible in many situations to double the educational effectiveness of audio-visual material by using the kind of research that I wish to discuss.

If I were to turn and start talking with my back to an audience, its reaction would be that I was a very stupid speaker. For it is perfectly obvious that unless I address my remarks to the audience so that it can hear them, I can in no way communicate with it. Similarly in using visual material if I were to present it in such a way that you could not see it, it would not communicate to you. In other words for audio-visual material to be effective, it must reach your ears and eyes in a sufficient intensity to produce a response. To be effective, audio-visual material must physically stimulate the auditory and visual sense organs.

It is equally important, however, for the audio-visual material to penetrate the psychological environment of the target audience if it is to have any instructional effect. It is just as important to penetrate the psychological environment of your target audience as it is to penetrate their physical environment.

Let me illustrate. Suppose you are making arrangements for your travel to a meeting. Suppose that you do not have a car and have decided to go by train. Let us suppose that under these conditions, you go to a travel agency and ask about transportation to Chicago. Suppose that the travel agent gives you an excellent booklet and road maps showing you precisely how to reach Chicago from your home community, and moreover, suppose he were to dwell at some length on the relative advantages of some particular way of reaching Chicago by car.

We all know what your reaction would be under such circumstances. You would think that the travel agent was stupid, if not downright insulting. If he continued talking to you only about how to reach Chicago by car and completely ignored your interest in having information about how to reach it by train, you would leave the travel agency and seek reservations through some other means.

This is precisely what our target audiences do when we fail to penetrate their psychological environment. They either walk out on us physically or they walk out on us psychologically.

Kurt Lewin made a major contribution to communication theory when he emphasized the importance of the psychological environment in determining people's behavior. He emphasized that

it is not enough to know what physical stimuli were impinging upon people; the important factor that determines their behavior is their psychological environment. He developed the concept of "life-space" and developed particularly useful methods for mapping and analyzing this life-space. This concept distinguishes between the environment of an individual as it exists for him, as contrasted with the environment of the same individual as others see it.

Personally, I have found the concept of life-space extremely useful in dealing with the problems of education and communication. One way in which a person's life-space can be thought of and mapped, is in terms of a series of concentric circles. The smallest circles at the core, are those which represent the interests, needs, problems, objects, events, and similar factors, with which the individual is most involved and most concerned. They are psychologically most "near" to him. The larger and more remote circles include those matters in which he has only a minor or peripheral interest or concern. These shade off into matters in which he has no interest or concern at all. These are parts of his environment that are psychologically "distant" from him.

Any experience or item of information which enters an individual's life-space influences his ideas and behavior. Those items which enter and affect his innermost life-space exert the most immediate and greatest influence, since they are touching upon the matters of greatest concern to him.

To go back to our example of the travel agent, observe that he may have been central in your physical environment—speaking forcefully and presenting you with visual materials about how to reach Chicago by car—but he was "distant" in your psychological environment (life-space) and consequently had little influence upon you.

This means, of course, that any audio-visual material, if it is to have educational effect, must deal with matters which fall within the central life-space of the individual and deal with it in words or symbols which the individual understands and recognizes as being related to him, personally. Any audio-visual material which the individual fails to see as being related to his life-space, will have no educational impact upon him.

I am sure that this point is perfectly obvious and one that we all accept, but the significant fact is that in the preparation and use of audio-visual instruction today we make little use of it. So far as I have been able to determine, it is extremely rare for an organization which is preparing audio-visual material to measure

quantitatively, and to map the life-space of the target audience as the first step in writing and developing the material to be presented. During the past war, tens of millions of dollars were used by the United States government and business organizations to prepare audio-visual material to educate and inform the civilian public or members of the Armed Forces on matters of real importance to them. A very substantial part of this huge sum of money was used by the agencies involved to prepare the audio-visual material without first attempting to measure, at least crudely, the life-space of the target audience. This same condition exists at the present time so far as the informational efforts of most government agencies are concerned.

The situation is somewhat improved today with regard to the advertising efforts of business organizations. It is not uncommon for an advertising agency to endeavor to map the life-space of its target audience before undertaking the preparation of copy or material for radio programs, television shows, or other presentations.

You will notice that I have emphasized the importance of measuring *quantitatively* the life-space of the individuals in any target audience that you wish to reach. I am convinced that you cannot accurately map the life-space of your target audience unless you have quantitative measurements. Measurements are required in order to know what matters fall within the life-space of your target audience, and particularly what matters fall in those smallest circles close to the core of their life-space.

In preparing audio-visual material many producers assume that their experience and intuitive judgment are sufficiently sound as a guide to these matters. At times, however, the individual or organization preparing the audio-visual material will feel some uncertainty about the life-space of the target audience and will turn to persons who are closer to the target audience, persons who are presumed to have expert knowledge of the life-space of the target audience. Even this approach, however, usually results in information which has serious and substantial errors in it as to the nature of the life-space of the target audience.

I do not know of a single study in which information on the life-space of a target audience obtained from experts or persons close to the target population was found to be correct when checked against direct measurements of the life-space of this target audience. Let me present a few results which illustrate the pattern of findings usually obtained.

It would seem reasonable to assume that foremen who are in close personal contact with the men working under them, would have reasonably accurate knowledge of the attitudes of these men. You would think that the foremen's knowledge of the men's attitudes would be especially accurate on matters discussed by the foremen with his men every day. Measurements show, however, that there can be substantial errors in the foreman's expert judgment of his men's attitudes and points of view. These results, shown in Figure 1,[1] are from a large manufacturing company in which time standards have been set for a substantial proportion of the jobs. Actual productivity is expressed as a percentage of standard. Expected production is, of course, 100 percent of the time standard. In this chart each vertical line, as you read across the chart, represents a different level of actual productivity expressed as a percentage of standard; this scale is shown at the bottom of the chart. The horizontal trend lines represent the answers to the different questions for the different groups as designated. Thus, the top trend line shows what the foremen feel to be the level of production that management expects. Low-producing foremen (those whose work groups have an actual productivity of 67 percent of standard or below) feel management expects about 97 percent. Foremen whose work groups produce at 82 percent or above feel that management expects about 100 percent of standard.

The second line, the line of dashes, shows what the men believe the foremen feel is a reasonable production figure. The low-producing men feel that foremen expect about 95 percent, while the high producers feel foremen expect about 100 percent.

The solid line shows what the foremen, themselves, believe is a reasonable production figure. It varies from 82 percent for foremen whose workers produce 67 percent and below to 100 percent for the high-producing foremen. The next line, with a long dash and two dots, shows what the foremen believe the men feel is a reasonable production figure. The bottom line shows what the men, themselves, believe is reasonable production.

Even a cursory examination of the results in Figure 1 shows that there is a serious discrepancy between what the foremen think is reasonable production and what the men think is reasonable production. Even more serious is the fact that the foremen do not realize how different these views are. Moreover, the men whose

[1] From a study directed by Dr. Robert L. Kahn.

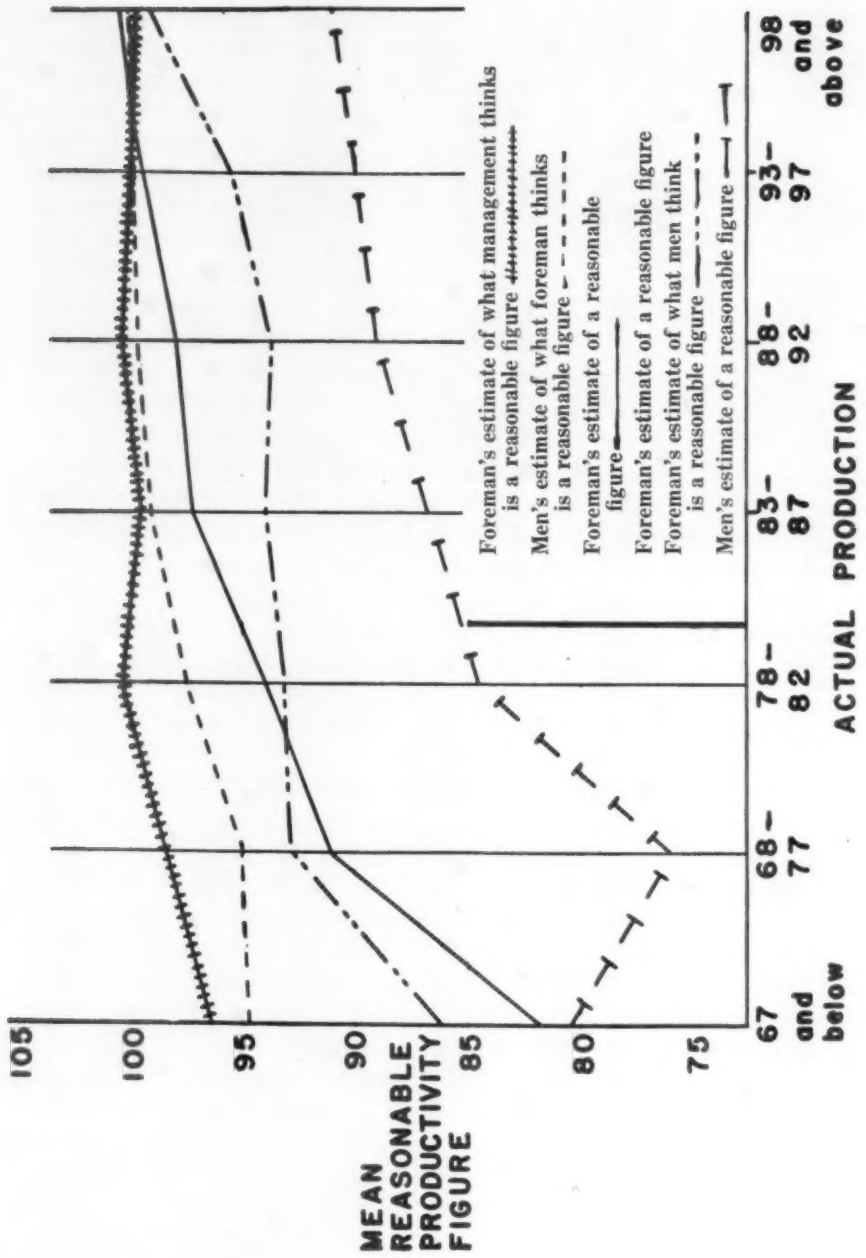
MEAN REASONABLE PRODUCTIVITY FIGURE
105
100
95
90
85
80
75
67 and below
68–77
78–82
83–87
88–92
93–97
98 and above
ACTUAL PRODUCTION
Foreman's estimate of what management thinks is a reasonable figure
Men's estimate of what foreman thinks is a reasonable figure
Foreman's estimate of a reasonable figure
Foreman's estimate of a reasonable figure
Foreman's estimate of what men think is a reasonable figure
Men's estimate of a reasonable figure

Figure 1

production falls below 93 percent believe the differences between their view and their foreman's view, as to what is reasonable, to be greater than it actually is. They magnify the conflict.

Note that this chart reflects more than a simple difference of opinions or judgment. We expect people and groups to differ in their judgment of fact. But here we have shown systematic errors in judgment of people regarding the opinions of others. Here is a situation involving several thousand men in which there is close personal contact every day. In spite of this close personal association these substantial errors exist in how each group believes the other group feels. No wonder there is difficulty in dealing with problems of production when each group is wrong in its assumptions as to how the other group feels.

Figure 2[2] shows what supervisors say employees want in a job in comparison with what the employees themselves say. As you will observe, supervisors are much more likely to emphasize matters related to pay such as free lunches, company benefits, etc. Workers, themselves, are much more likely to emphasize the importance of congenial working associates and matters concerning human relations in the work group. It is interesting that when you ask supervisors in turn what *they* want in a job and compare their answers with the answers of their superiors, you find a similar discrepancy. The superiors, again, are much more likely to say that the supervisors want high pay, company benefits, and other forms of economic income much more than the supervisors, themselves, do. The supervisors, themselves, are much more likely to emphasize the importance of congenial working groups and the need of having a job which involves doing something that is significant and important in itself. At every level in an organization we find this systematic error in perception of the needs and opinions of people at lower levels.

If a person about to prepare audio-visual material to be used with workers were to use the foreman as a source of information for mapping the life-space of the workers, there could be substantial errors, as we have seen, in what this life-space would look like when so mapped. Moreover, any audio-visual instruction based on these incorrect maps of the life-space of the target audience, would be appreciably less likely to penetrate the life-space of the target audience and consequently would be far less effective than potentially possible.

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[2] Morse, N. *Satisfactions in the White-Collar Job.* Ann Arbor, Mich.: Survey Research Center, University of Michigan, July 1953.

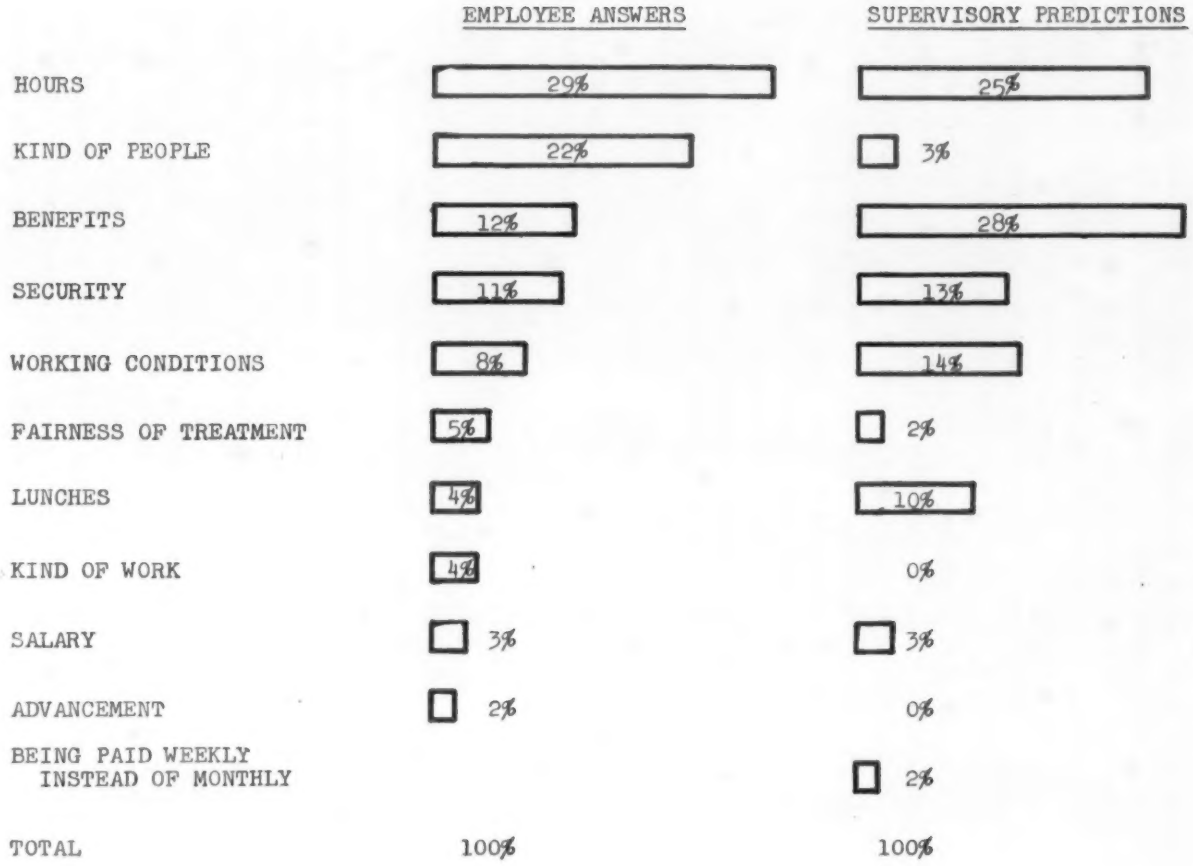
EMPLOYEE ANSWERS
SUPERVISORY PREDICTIONS
HOURS
29%
25%
KIND OF PEOPLE
22%
3%
BENEFITS
12%
28%
SECURITY
11%
13%
WORKING CONDITIONS
8%
14%
FAIRNESS OF TREATMENT
5%
2%
LUNCHES
4%
10%
KIND OF WORK
4%
0%
SALARY
3%
3%
ADVANCEMENT
2%
0%
BEING PAID WEEKLY INSTEAD OF MONTHLY
2%
TOTAL
100%
100%

Figure 2

In situations involving such problems as what people want in a job, it is often not sufficient to ask them or their boss what it is they want. In such circumstances, what the individual says he wants and what others think he wants may both be partially in error. In such situations, it often is necessary to obtain from each individual in the sample, measurements of his behavior and measurements of the motivational forces acting upon him. Analysis which relates these measurements mathematically can then show (4, 7) the relative strength of the different motivational forces functioning in the life-space of the target audience. What people say they want in such situations is also useful in preparing audio-visual material, however, for it suggests some of the concepts and vocabulary that are most likely to be understood.

Jenkins and Lippitt (5) in a study in Newton, Massachusetts, obtained information from high-school students, the parents of these students, and the teachers of these students. When the results were analyzed, it was found that the teachers were frequently wrong in what they said about how high-school students felt about particular matters. Similarly the parents were wrong, both about how their youngsters felt on these matters and also how the teachers felt. It was also true that the youngsters, themselves, were often incorrect in their judgments of how the teachers felt and how their parents felt about the matters studied. Those strained relationships which existed between parents, teachers and students appeared to rest to an appreciable extent upon distorted impressions of the points of view of others.

For example, what is the proper relationship to the classroom and the teacher that parents should establish? A great majority of both parents and teachers agreed that the parents should have some "cooperative" function with the teacher, but when it came to specifics they differed greatly and perceived incorrectly the other's point of view. Take the matter of cooperation through having conferences with the teacher: 85 percent of the teachers volunteered this as a desirable way for a parent to cooperate, but only 25 percent of the parents mentioned this. Despite the strong desire expressed by teachers, only one-fourth of the parents recognized that the teachers wanted to confer with them.

I hope these few illustrations are sufficient to demonstrate that the judgment of experts on the interests and life-space of any target audience is almost certain to contain errors. Sometimes these errors are small, sometimes they are substantial, but one never knows the extent of error in advance of obtaining accurate,

direct measurements. We have conducted a number of studies in which we have mapped, through the sample interview procedure, the life-space of a wide variety of target audiences. We have never conducted a study which did not yield some results which differed substantially from the expectations of the persons closest to the problem.

It might help to cite an illustration to show how the knowledge of the life-space of a target audience can be used. The War Bond (later the Savings or Defense Bond) Division of the Treasury Department has made extensive and consistent use of the sample survey techniques to map the life-space of their target audience. They and the Federal Civil Defense Administration have made particularly effective use of sample surveys to map the life-space of their target audiences. This has enabled them to improve substantially the impact of their informational and educational efforts. The survey results have also been useful to help guide broad policy decisions.

Let me cite an illustration from one study (3) done on war bond sales. As you all know, the major reason for selling low-denomination Series E bonds to individuals during the war years was to mop up purchasing power as an inflation control mechanism. In spite of the fact that this was the major reason for actively selling bonds, only about a quarter of the people in the United States recognized this fact. The bulk of the people in the United States look at Governmental fiscal matters in much the same way that they look at their own personal financial affairs. From this standpoint it was perfectly clear to them that the reason the United States Government was interested in selling bonds was to obtain money for the purchase of tanks, planes, and guns. About half the people in the United States, when specifically told in an interview that the primary purpose in selling war bonds was for inflation control purposes, said they did not believe it. That is, the life-space of over half of the people was found not to include the idea that the purchasing of bonds by individuals could help to keep prices down. If the Treasury had emphasized inflation control to this segment of the population and had given no other reason for the purchase of bonds, it would have encountered resistance likely to have had a serious adverse effect upon the purchase of the bonds.

When the Treasury discovered that about three-quarters of the population did not understand how the selling of bonds to individuals could help hold prices down, they recognized that inflation control, as such, could not be used directly as a major

appeal to persuade these people to buy bonds. This idea was not psychologically near. The research findings showed, however, that the more different reasons that people saw for buying bonds, the more bonds they were likely to buy. The Treasury then used both of these items of information. They developed appeals known to be psychologically relevant such as "Buy Bonds To Help Keep America Strong," and then built their presentation of specific reasons into this idea known to be central to the life-space of a great majority of the people. Thus, for example, people were urged to "Help Keep America Strong" by taking the pressure off of prices of goods and commodities that were scarce by not trying to buy them now. They were urged not to buy anything which they did not urgently need, but to save now so as to have funds available for post-war buying and thus assure a Strong America with Good Business and Full Employment in the post-war period.

During the war, several governmental agencies cooperated in a major program to improve nutritional habits in order to maintain the energy and health of the public. Initially this program of nutrition concentrated upon reaching housewives through study groups led by trained nutritionists. When we studied this program we found a situation which exists so often with discussion groups, those who were already "saved" were the people who attended. No doubt these people learned additional facts about nutrition which was useful, but the program failed to reach the substantial proportion of the population who were uninformed about nutrition and uninterested in it. The problems were not in their life-space.

Research showed, however, that these uninformed persons were concerned about the food shortages and eagerly sought ideas on menus and recipes that they could use in feeding their families. They read newspaper material on these topics and listened to radio programs dealing with them. Food shortage was central to their life-space; nutrition was not.

The nutrition education program, accordingly, worked to have nutrition information included in these programs. Menus and recipes were stated to be good because they included an adequate amount of minerals or vitamins. Simple nutritional standards were referred to favorably in presenting a tasty recipe. In this manner through content known to be psychologically close to housewives, the nutrition education program sought to arouse an interest in nutrition to make them realize that nutrition is important, to give them some facts about nutrition, and to improve food habits. This illustration again shows how experts can be wrong

as to the content of the life-space of their target audience. It also illustrates how people's life-space when accurately mapped, can be entered and enlarged. Enlarging people's life-space to include matters of unrecognized importance to them, is an essential function of audio-visual instruction.

It is not only necessary to measure the life-space of the target audience prior to undertaking the preparation of any substantial amounts of audio-visual material, it is essential that this measurement be obtained just prior to the preparation of this material. This is necessary because the life-space of individuals changes under the impact of changing conditions. Usually these changes in life-space occur slowly, but in crisis situations like a war they can change rapidly. Immediately after the outbreak of the war in Korea people were very much concerned about shortages of goods and of the increase in prices. Today people are much more concerned about the security of their jobs and having a full work week (if they are employed) or, if they are farmers, in having an adequate price for the farm goods they produce. As a book (2) published this Spring analyzing the voting behavior in the 1952 election shows, there was a substantial change in the life-space of voters between 1948 and 1952. In the 1948 presidential election, foreign issues were much less prominent in the life-space of voters and exercised much less influence in the outcome of that election than did domestic issues. In 1952, on the other hand, domestic issues were relatively less important and exercised much less influence on the vote. In 1952, Korea and solving the problems that we faced there loomed much larger in the life-space of voters and this issue was much more related to the way people voted than were domestic issues.

During the past decade a powerful research tool has been developed for mapping of the life-space of target audiences. This research tool is called the sample-interview survey. The methodology involved in using this research tool is available in published form. I should like to stress, however, the importance of using the best methodology now available if satisfactory results are to be obtained. The sampling, for example, should use probability methods and for mapping the life-space of a target audience, the open-end question technique is particularly useful. (1, 4, 6)

The results from a sample survey will indicate with satisfactory accuracy what the life-space is for a target audience as a whole and for major subdivisions of any target audience. In addition it not only provides information for mapping the life-

space, it can also be used to discover what words, symbols, concepts, etc. are readily and correctly understood by the individuals in the target audience and can be used as a point of contact for introducing new ideas; that is, for conveying information or attitudes.

Once you have mapped with reasonable accuracy the life-space of your target audience, there is one very important question to ask as you start planning the production of audio-visual materials. This question is, "How can I relate my educational or instructional message to the interests, motivations and goals, which are closest to the core of the life-space of my target audience?" To see and create this linkage is where artistic creativity makes such an important contribution to audio-visual material. Whenever audio-visual material makes clear to a target audience how its most important goals and needs can be better fulfilled by using the ideas and material presented, you can be confident that such audio-visual material will have a very great educational impact.

I suspect that those among you who produce or use audio-visual material are eager to have the material have a maximum impact upon your target audiences. I suspect that this objective falls within your life-space and probably is among the more central of your interests. I hope, therefore, that I have been successful in creating a way to present the following message in such a way that I linked it to the core of your life-space: "In preparing any audio-visual material which involves an expenditure of, say, more than $10,000, you would probably increase substantially the effectiveness of this material if you first invested at least five percent of your budget in research to map the life-space of your target audience." I am sure this statement is true and I wish that I could so state it that it would enter your life-space and become an inextricable part of your own convictions about how to produce effective audio-visual material.

If you analyze what I have been saying, you will observe that the sample-interview survey can perform the same function for the preparation of audio-visual material and for guiding its use that the Signal Corps performs for the Army. In other words, the sample-interview survey can be used as "the eyes and ears" to guide the preparation and use of audio-visual material. The Signal Corps prepares maps to guide military operations. The sample survey can be used to map the life-space of your target audience. The Signal Corps provides continuous information as to the progress that any military effort makes toward its objective. The sample interview can be used in a similar manner to measure

how well a particular audio-visual endeavor achieves its objective.

It usually requires more data and a more extensive study to map the life-space of a particular target audience than it does to measure the effectiveness of any particular material in achieving a particular instructional objective. There has been much more use of research in the audio-visual field to measure the effectiveness of instructional material than to map the life-space of target audiences. I would like to point out that this is a very limited use of research and one that prevents you from obtaining the full value of research.

May I illustrate my point with an analogy. Suppose that you were about to leave Chicago to go to New York by car and that you had accurate maps and full information about how to reach New York. Moreover, let's assume that occasionally on the trip to New York you check your progress by asking where you are and the direction to New York. Under such circumstances, I am confident that your efforts to reach New York would be relatively efficient and that you would reach New York with reasonable speed. Your "research" would precede action at each decision point.

On the other hand, suppose that you were leaving Chicago by car for New York but that you did not have any map; all that you knew was that you wanted to reach New York and that it was east of Chicago. Even though periodically after you set out in a car you would ask the distance to New York and the direction of New York, I think we could reasonably predict that your efforts to reach New York would be highly inefficient, you would travel many unnecessary miles and waste a great deal of time. In this case your "research" would follow decision and have only a corrective or evaluational function.

It seems to me, however, that this is precisely what we are doing today in the preparation and use of audio-visual material. With rare exceptions, we do not map the life-space of our target audience in advance and consequently we do not have accurate information to guide our efforts in the preparation of the audio-visual material. After we have prepared the material we may make some limited tests to see how well our material is achieving its objective; that is, whether or not it is getting us to New York. On the basis of these limited measures, we may make some changes and improvements in our audio-visual material but it may still fall far short of its maximum potential effectiveness. Unless we know what the life-space of our target audience is and how we

are trying to link our education or instructional message to the life-space of this target audience, we cannot be efficient in our efforts to measure our success in achieving these objectives. On the other hand if we have accurately mapped the life-space of our target audience, then in measuring the effectiveness of our instructional material, we can discover the extent to which it has or has not penetrated the life-space of our target audience and linked the educational message that we were trying to get across to the concern, interests and dominant motivational forces present in the target audience.

I hope these suggestions may be useful to you. I believe we are on the threshold of a great development in the use of audio-visual material for educational and instructional purposes. I am convinced that it has great power which we have only partially tapped. I fully believe that the sample survey can materially improve the power of audio-visual material by providing a sound basis for assuring that the content is psychologically "near" the target audience and thus can have an impact on the audience.

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HOW ACCURATELY ARE DIFFERENT KINDS OF GRAPHS READ?[1]

•LEWIS V. PETERSON

•WILBUR SCHRAMM

This paper summarizes the previous research on the problem of reading graphs and reports a study comparing the accuracy of reading eight kinds of common graphs. Lewis V. Peterson is Producer-Supervisor of Television and Motion Pictures at the University of Illinois, and Wilbur Schramm is Dean of the Division of Communications at the University of Illinois.

THE GENERAL problem of this paper is the relative accuracy with which different forms of graphs are perceived.

The specific case of the problem chosen for testing is perhaps the most common of all situations for which graphs are used: the comparison of parts of a whole. Let us suppose that a whole has a number of parts, and it is desired to convey graphically the relative size of those parts. Any one of a number of graphic forms may be used. The question is, which one is likely to be read most accurately? And if for any reason the subject matter does not lend itself to that most desirable form of graph, are there any forms which are read with notable inaccuracy and therefore to be avoided? These are the practical questions which this research is designed to answer.

In order to limit the problems, the case tested here is one in which the whole has five parts, and the number of graphic forms is limited to eight. These eight represent, with the exception of the pictograph, the most commonly used graphs. The specific

[1] The research which this paper reports was supported in large part under contract with the U. S. Air Force, monitored by the Human Resources Research Institute, Maxwell Air Force Base, Alabama. This is one of a number of research reports prepared for the Air Force by members of the Institute of Communications Research, University of Illinois. Field work for this study was in charge of Dr. Clifford Christensen and Dr. Kalmer Stordahl. Mrs. Mary Snowden was statistical assistant.

purpose of the research described in this paper, therefore, is to test the relative accuracy with which five parts of a whole can be read when represented in eight different graphic ways.

PREVIOUS RESEARCH ON THE PROBLEM

Until about 1926, armchair experts "knew" which forms of graph were read most easily and accurately. One form universally condemned was the circle or pie graph. It seems ridiculous now to read arguments explaining why the human eye is unable to judge degrees of angle or the chord of a circle. Then, Mathews (6) startled the experts by finding that circle graphs seemed to be read more easily by school children than bar graphs or line graphs. Eels (5) prepared a set of bar graphs and a set of circle graphs, each set with the same percentage divisions, and found that college students read the circle proportions just as rapidly as and more accurately than they read the bars.

These results stimulated a series of experiments by Croxton and collaborators, reported in the *Journal of the American Statistical Association*. Comparing the pie chart and the bar graph, Croxton and Stryker (1) found that when graphs express only two proportions, the pie is read more accurately if the proportions are 50-50 or 25-75, but that there is little to choose between the two forms with other proportions. When there are three or four divisions, the pie seems to be estimated more accurately. With five divisions, no difference was found between the accuracy of reading the two forms.

Croxton and Stein (2) compared bars, squares, circles, and cubes, when used to compare a larger sum with a smaller one. They found that observers were most accurate in estimating the relative size of the bars. They discovered no difference in the accuracy of reading circles and squares, but found that both squares and circles were judged more accurately than cubes. Thus the hypothesis seems to be that the more dimensions are added, the less accurately the size is estimated.

Washburne (9) tested pictographs against line graphs and bar graphs, and advanced the suggestion that pictographs may be better for showing simple static comparisons. Thomas (7) found that school children could read rank most easily from pictorial graphs, with circle, two-dimensional graphs, and line graphs following in order. Wrightstone (10) found no difference in the ability of high-school students to interpret pictographs and conventional graphs.

There are several other studies, but they add little to the research here mentioned.

The import of this existing research seems to be that the old prejudice against circle graphs was unfounded, that in some cases circle graphs may be read more accurately than line or bar graphs, and that there is some reason for suspecting that adding dimensions to graphic forms makes them harder to read accurately. But there is little that seems settled, and little comfort for the editor who faces the recurring practical problem: Given eight or nine common types of graphs, which can he most confidently use, and which should he avoid?

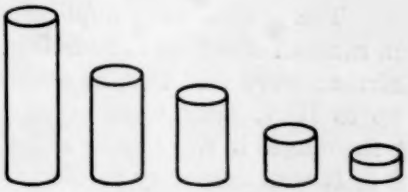
THE METHOD OF THIS RESEARCH

In designing this research, therefore, it was decided to include all except one of the graphs most commonly available to the editor who seeks to represent parts of a whole. The one common form omitted was the pictograph, which was left out because subject matter introduces an important variable into the design of pictographs which has no parallel in the design of other forms of graph. The eight forms of graphs used in this study include: circle graph; disc graph; single bar graph; multiple bar graph; multiple cylinder graph; multiple square column graph; multiple area column graph; partial cosmograph. Each of these forms is illustrated in Figure 1.

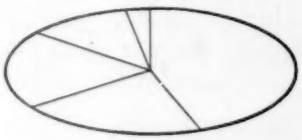
A graph was constructed by the same artist in each of these forms, embodying the same five proportions—43%, 23%, 18%, 10%, and 6%. It will be noted that care was taken to avoid the most common proportions such as one-half, one-third, one-fourth, and one-fifth. Each test graph was about 3 x 5 inches in size.

To help conceal the similarity of proportions in the test graphs, two steps were taken. For one thing, each graph was given a different title. In addition, the artist constructed another graph in each of the forms, as a decoy. The second graph had two of its five parts identical to parts of the test graph, the other three different. No two pairs of graphs (test and decoy) had the *same* two parts identical. Thus, when the 16 graphs were presented in random order, the effect was of a series of graphs somewhat similar but still somewhat different, and pre-testing failed to show any evidence that subjects were aware that some of the graphs did indeed have identical proportions.

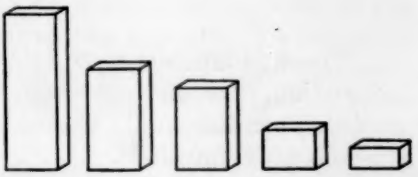
CIRCLE GRAPH



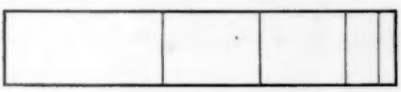
MULTIPLE CYLINDER GRAPH



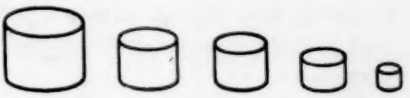
DISC GRAPH



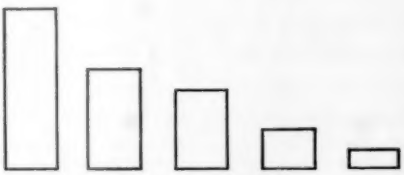
MULTIPLE SQUARE COLUMN GRAPH



SINGLE BAR GRAPH



MULTIPLE AREA COLUMN GRAPH



MULTIPLE BAR GRAPH

PARTIAL COSMOGRAPH

Figure 1

The graphs were duplicated by offset printing and presented, in random order, to 112 airmen at Sampson Air Force Base. These airmen were told that in each case the parts of the graph added up to 100%. They were asked to write their estimate of the five percentages in five blanks at the right of each graph.

It was necessary to discard some papers because the instructions had been misunderstood, the blanks were not completely filled, or the intent was not clear. After these discards, 86 papers remained. These represented 86 x 5 x 8, or a total of 3440 judgments. These are the data from which the results detailed below are derived.

RESULTS

These judgments were tabulated by subject, by graph, and by proportion. Size and direction (plus or minus) of error were recorded. Then these data were given statistical treatment to answer the following questions.

Does it make any difference which graph is used?

An analysis of variance was made to test the null hypothesis —that there was no significant difference in the accuracy with which the different forms of graph were read. In this test, F for variation between graphs, proved to be significant at less than the 1% level, and it is therefore possible to say with great confidence that it does make a difference in accuracy of reading which graph is used.[2]

In general, which graphs are read more accurately than others?

These were the means of errors[3] in reading the different forms of graphs:

Circle graph	10.14
Single bar	10.65
Multiple square column	11.21
Multiple bar	11.76
Partial cosmograph	12.37

[2] For reference, here is the analysis of variance table:

Variation	*Sum of Squares*	*d.f.*	*Mean Sq.*	*F*
Between graphs	3,547.83	7	506.83	17.20
Between men	6,385.75	85	75.13	2.55
Error	17,530.42	595	29.46	

$F\ 17.20 < .01$

Bartlett's homogeneity of variance test was performed in connection with these treatments and found in each case to be non-significant.

[3] The *error* is the cumulative average of the differences between (a) the estimate of the airman and (b) the actual proportions of the five parts of a graph.

Disc	12.65
Multiple cylinder	13.30
Multiple area columns	17.92

The question is, which of these differences are statistically significant and which could have arisen by chance?

It appears from this table that the amount of error in reading the multiple area column graph is notably greater than the errors in reading other graphs. Analysis of variance confirms that the reading in the case of this one graph is indeed significantly different (at the 1% level) from all the others.[4] Then the question arises, is all significant variation in the reading of this group of graphs due to the variation in the reading of this one graph? Looking at the second analysis of variance table,[4] it will be seen that the answer is no. There is significant variation among the other graphs as well. This variation is considerable because F in the table is significant at 1%.

In order to reveal this variation as clearly as possible, use was made of John W. Tukey's method of comparing individual means in the analysis of variance (8). This test showed the circle graph reading to be significantly different (at less than the 5% level) from all the other graphs, and (at the 10% level) the single bar graph to be read differently from all the remaining graphs except the circle. As previously suggested, the multiple area columns were shown to be different from all the other graphs (at less than the 5% level).

Thus we can say with some confidence that, so far as these data are representative:

1. **The circle graph is read most accurately when used in this way to compare parts of a whole.**
2. **The multiple area column graph is read least accurately.**
3. **The single bar, multiple square column, multiple bar, partial cosmograph, disc, and multiple cylinder appear to comprise a middle group, read less accurately than the circle, more accurately than the multiple area column.**
4. **Of this middle group, there is some evidence that the single bar is most accurately read.**

[4] The second analysis of variance table is as follows:

Variation	*Sum of Squares*	*d.f.*	*Mean Sq.*	*F*
Between graph and pooled graphs	2,885.78	1	2,885.78	97.99
Between pooled graphs	662.05	6	110.34	3.74
Between men	6,385.75	85	75.13	
Error	17,530.42	595	29.46	

Both these F's are significant at less than .01.

5. Within this middle group, there are still differences which these tests do not bring out in a statistically significant form.

What effect does foreshortening have?

A common artistic device in presenting graphic material is to foreshorten the graph; for example, to show a circle turned partly on its side as though one were looking across the top of a silver dollar. An example of this is the disc graph. In order to find out the effect of such foreshortening on accuracy of reading, a t-test was used to compare the reading of the circle graph with the reading of the disc. This revealed significant difference (at the 1% level) between the reading of the two graphs.[5] Since the difference is in favor of the circle we can say with confidence that, so far as this use is concerned, **foreshortening a circle makes for less accurate reading.**

Does adding a dimension to a graph make for less accurate reading?

The experiment was designed so as to permit a comparison of two of the most common graphs that vary in two dimensions (the square columns and the cylinders) and to compare each of these with the multiple bar graph. Analysis of variance showed that there is a significant difference (at the 5% level) between the means of error on those three graphs.[6]

Proceeding now to explore those differences by means of the Tukey test, it is possible to divide the three graphs into two groups. The reading of square columns and multiple bars is significantly different (at the 5% level) from the reading of the cylinder graph.

Thus it is possible to say that:

Among forms of graphs which vary in two dimensions, the multiple square column graph is read significantly more accurately than the multiple cylinder graph.

In fact, the square columns are read as accurately as one of the favorite single-dimension graphs—the multiple bar graph. It

[5] t (for 85 d.f.) was 3.865.

[6] The analysis of variance table:

Variation	*Sum of Squares*	*d.f.*	*Mean Sq.*	*F*
Between graphs	202.70	2	101.35	3.68
Between men	4,374.95	85	51.47	1.87
Error	4,677.30	170	27.51	

F of 3.68 (d.f. 2) is significant at $< .05$.

This analysis of variance and the preceding t-test of the circle and disc are statistically justified in being carried out without regard to the data or the remaining graphs because these were comparisons conceived prior to the running of the experiment. This is in contrast to the other comparisons desired *after* the experiments were run; these had to be made by use of the Tukey test.

is therefore not possible to say that the variation of a graph is more than one dimension per se causes the graph to be read less accurately.

Is there any pattern in the way proportions in different graphs are underestimated or overestimated?

Table I shows the number of subjects who overestimated, underestimated, or made an exact estimate of each proportion in each kind of graph.

TABLE I—DIRECTION OF ERROR

	Area	Sq Col	Cyl	M Bar	S Bar	Cos	Disc	Cir
*Largest proportion**								
Over	3	34	22	25	27	35	34	39
Exact	2	6	5	5	4	1	6	6
Under	81	46	59	56	55	50	46	41
*Next largest**								
Over	56	43	49	60	51	37	67	45
Exact	14	10	6	10	8	14	8	21
Under	16	33	31	16	27	35	11	20
*Next**								
Over	62	38	30	40	26	22	21	23
Exact	15	20	24	19	25	12	7	17
Under	9	28	32	27	35	52	58	46
*Next**								
Over	63	31	67	31	31	35	52	43
Exact	17	32	14	28	27	25	25	23
Under	6	23	5	27	28	26	9	20
*Smallest**								
Over	56	34	31	28	22	27	47	38
Exact	8	11	17	19	15	17	10	9
Under	22	41	38	39	49	42	29	39

* The proportions, from largest to smallest, are 43%, 23%, 18%, 10% and 6%.

Applying to this table the sign test developed by Dixon and Mood, and described by Dixon and Massey (4), it is possible to say which of these differences between overestimates and underestimates are statistically significant. Table II shows the results of applying the Dixon-Mood test. A square marked "-" means that this proportion in this particular graph or group of graphs was significantly underestimated (at the 1% confidence level). A square marked "†" means that the proportion was significantly overestimated. "O" means that the under- or overestimation was not statistically significant at the 1% level.

TABLE II—PROPORTIONS WHICH WERE SIGNIFICANTLY OVER- OR UNDERESTIMATED

	Area Col.	Square Col.	Cyl.	M Bar	S Bar	Cosmo-graph	Disc	Circle	Over-all
Largest proportion	–	0	–	–	–	0	0	0	–
Next*	†	0	0	†	†	0	†	†	†
Next*	†	0	0	0	0	–	–	–	0
Next*	†	0	†	0	0	0	†	†	†
Smallest*	†	0	0	0	–	0	0	0	0

All significances at 1% level; † — Significantly overestimated; — Significantly underestimated; 0 — Under- or overestimation not statistically significant.
* The proportions, from largest to smallest, are 43%, 23%, 18%, 10% and 6%.

Looking at this table, we can draw certain general conclusions:

1. The largest part, in comparison of the parts in a whole, tends to be underestimated.

2. Some of the middle parts, notably the second and fourth, tend to be overestimated.

3. Multiple area columns, which we found on earlier tests to be least accurately read, show a consistent overestimation of every part, except the largest, which is consistently underestimated.

4. Although less accurately read over-all, square columns and the partial cosmograph seem to have a slight advantage over other forms in that they appear to be more consistently read throughout all their proportions. Whereas more accurately read forms, like the circle graph, balance out overestimates and underestimates from one part to another, these two forms show little or no evidence of consistent over- or underestimation.

How Widely May These Conclusions Be Generalized?

Three elements must be considered when we try to estimate how widely applicable these conclusions are: (a) the use to which graphs are put, (b) the subject matter with which they deal, (c) the readers who use them.

So far as the first of these is concerned, the authors of this paper feel it would be unjustified, without further investigation, to generalize these conclusions to all uses of graphs. These conclusions apply to a specific, though very common, use of graphs: to represent parts of a whole. Undoubtedly some of the results here found would be duplicated in studies of other graph uses, but until such studies are made it would be unsafe to assume that the results would be the same. Meanwhile, as a rule of thumb, these

conclusions can be applied with more confidence to graph uses which resemble the part-whole graph (for example, simple comparisons) than to graph uses which are widely different (for example, graphs that show trends).

In the second place, there is no evidence in the literature that subject matter makes any difference in the accuracy with which these graphs are read, and, in the absence of such evidence, it may be assumed that these conclusions apply whether a graph represents parts of aircraft production or parts of the national income or whatever. However, it is intuitively convincing that subject matter should have some effect on the choice of graphic form. This is another problem that needs to be looked into.

So far as the audience is concerned, it should be said that the subjects of these tests were airmen, just out of civilian life, male, average age a little over 19, average education between 11 and 12 years. They were motivated to do well because these tests were given in connection with their Air Force classification examinations. Results of these tests may certainly be applied to airmen in general, and to other service personnel of similar characteristics. There is nothing in the literature to indicate that sex makes any difference in the accuracy with which graphs are read. These subjects were so recently out of civilian life that there is no reason to think their scores would be unlike a similar group of civilians. Whether the results can be generalized to persons older or younger, or with more education or less education, is not known, and should be investigated. It may be assumed, though, that the chief variable in this situation would be the amount of training or experience in use of graphs. We know that this affects the ability to read graphs, but whether it affects the ability to *read different kinds of graphs more accurately than others* we do not know. It is felt that, in the absence of more detailed data, these conclusions may be applied widely among audiences.

SUMMARY

The problem of how acurately we can read different forms of graphs is becoming increasingly important because of our increasing dependence on graphs in technical materials. This research was designed to come as near as possible to one of the versions of this problem which technical editors most often face: Given the need of presenting a comparison of parts of a whole (for example, distribution of a budget among different units, or sources of air-

craft production), which of the eight or nine commonly used graphs available to the editor should he employ if he wants his graph to be read as accurately as possible?

Eight forms of graphs (circle, disc, single bar, multiple bar, multiple cylinder, multiple square columns, multiple area columns, and partial cosmograph) were constructed. Each graph used the same five proportions. The similarity was concealed by giving each graph a different title, and by presenting the test graph in a random fashion among decoy graphs which resembled them in some proportions but not in others. These graphs were presented to 86 airmen, at Sampson Air Force Base, who estimated the relative proportions in each case. Thus, the respondents made 86 x 5 x 8 or a total of 3440 judgments on the graphs that were being tested.

Using analysis of variance, the Tukey method for comparing individual means in the analysis of variance, and the Dixon-Mood sign test, these data were analyzed and the following conclusions arrived at:

1. It makes a significant difference which form of graph you use if you are interested in how accurately the graph is to be read.
2. The *circle graph* is read *most* accurately when used in this way to compare parts of a whole.
3. The *multiple area column graph* is read *least* accurately.
4. The *single bar, multiple square column, multiple bar, partial cosmograph, disc,* and *multiple cylinder* appear to comprise a middle group, so far as accuracy of reading is concerned—less accurately read than the circle, more accurately than the multiple area column.
5. Of this middle group, there is some evidence that the *single bar* is more accurately read than the others.
6. Within this middle group there are still differences in accuracy of reading, not all of which these tests bring out as statistically significant, but which in another situation might turn out to be significant.
7. It appears to make for less accurate reading when the artist foreshortens a graph (for example, when he turns a circle graph partly on its side and makes a disc graph).
8. Among forms that vary in two dimensions, the multiple square bar graph is read more accurately than the multiple cylinder graph.
9. Varying graphs in more than one dimension does not per se cause them to be read less accurately.

10. The largest part, in comparison of the parts in a whole, tends to be underestimated.

11. Some of the middle parts (in size), notably the second and fourth, tend to be overestimated.

12. Although less accurately read over-all, square columns and the partial cosmograph seem to have a slight advantage over other forms in the respect that they appear to be more consistently read throughout all their proportions. Whereas more accurately read forms like the circle graph balance out their overestimations and underestimations from one proportion to another, these two forms show little or no evidence of consistent overestimation or underestimation from proportion to proportion.

How far may these results be generalized? In the absence of more detailed investigation, it is felt that: (a) they may be applied without regard to the subject matter which the graph treats; (b) they may be applied with considerable confidence to readers of a different kind than those tested; (c) they may *not* be applied to all uses of graphs, although they can be applied with more confidence to similar uses (for example, the use of graphs to show simple comparisons) than to very different uses (such as the use of graphs to show trends).

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THE MASS COMMUNICATION PROGRAM IN UNESCO

UNESCO is conducting a broad program in the area of mass communication, yet this program is unknown to many audio-visual educators. This paper describes the activities of the six divisions of UNESCO's Mass Communication Department. It was written by a staff member of the Secretariat in Paris and made available for publication by Gerald L. Carnes, Director of the Department of Mass Communication of UNESCO in New York.

UNESCO was created to contribute to peace and security by promoting cooperation among the nations through education, science and culture. In order to do this, the organization is instructed by its constitution to "collaborate in the work of advancing the mutual knowledge and understanding of peoples through all the means of mass communications."

The field of communications is therefore one of the most important in which *UNESCO* operates. The definition of communication given by Dr. Edgar Dale in the first number of the *Audio-Visual Communication Review*—"the ability to take the other fellow into account while you are talking or acting"—is directly relevant to these operations. For, on the world scale, taking the other fellow into account means making it more possible for peoples as well as persons to take one another into account, and hence also to help them know and understand one another better. And in the modern world, communication must be considered in the framework of the great masses of human beings, and developed and improved through the press, film, radio, television and kindred media of mass communication.

In essence the aim of *UNESCO's* Mass Communication Department is to encourage these media to serve the purpose of the organization and to participate in its efforts. There are six divisions in the department: Division of Improvement of Means and Techniques of Communications; Division of Free Flow of Information; Divi-

sion of Voluntary International Assistance; Press Division; Radio Division; and the Film and Visual Information Division.

It is intended here to give a sampling rather than a comprehensive survey of the general range of the activities of the Mass Communication Department.

DIVISION OF IMPROVEMENT OF MEANS AND TECHNIQUES OF COMMUNICATION

The work of the *Division of Improvement of Means and Techniques of Communication* is designed to provide users of mass communications with information about improvements and developments in press, film, radio and television and to help the organization's member states in using these media for educational, scientific and cultural purposes. There are three main classes of activity.

A clearinghouse is maintained to gather and distribute information about progress in the use of mass communications, so that the experience and the knowledge gained in certain countries may be of benefit to other countries. For this purpose, the clearinghouse undertakes studies on specific questions, issues documents, catalogues and publications. The second kind of activity is the promotion and conducting of research and experiments in the field, in order to evaluate the effectiveness of different techniques and obtain fuller knowledge of the ways in which the media of mass communications can be used to further the aims of *UNESCO*. Finally, direct help is given to member states to develop their communication services, by means of missions, study courses and seminars.

In order that all these activities might be based upon established facts, the division undertook, from 1947 to 1951, a survey of the structure, equipment, and operation of news services, press, film, and radio in 156 countries and territories. The original object was to determine the damage suffered by these agencies during the war, as well as the nature and extent of their technical needs. But in 1948 it was decided that the surveys should be extended to countries whose technical equipment was inadequately developed, and the following year there was a further extension to include all countries so that knowledge of the technical resources and of the methods of well-developed countries might be made generally available.

The surveys, completed in 1951, were carried out in 126 countries and territories by field workers and in 30 others by the

exchange of correspondence. The results were published in five volumes, two supplements, and a single-volume over-all compendium of concise data. The knowledge collected has served as the basis for the missions, studies, campaigns, monographs, and other activities of the division.

The clearinghouse meets the requests for information and advice from governments, professionals, professional bodies, and other departments of *UNESCO*. It also distributes information on subjects which are known to be of importance to workers in the field, either in the form of printed publications or of mimeographed papers. Contact is maintained with professionals through correspondence, through questionnaires addressed to persons and organizations listed in a register of mass communication specialists, and through the attendance by staff members at important congresses and meetings. This permits the clearinghouse to choose the subjects of papers and publications in relation to the known needs of the moment.

The range of studies on problems of mass communication is illustrated by some of the titles of publications which *UNESCO* has issued in its series on "Press, Film and Radio in the World Today." These are, for example:

Visual Aids in Fundamental Education
Television and Education in the United States, by Charles A. Siepmann
The Use of Mobile Cinema and Radio Vans in Fundamental Education
Low-Cost Radio Reception by Claude Mercier
Professional Training of Journalists by Robert W. Desmond
Training for Radio by Maurice Gorham
Education by Radio: School Broadcasting by Roger Clausse
Radio in Fundamental Education by J. Grenfell Williams
Professional Training of Film Technicians by Jean Lods
The Entertainment Film for Juvenile Audiences by Henry Storck
The Film Industry in Six European Countries
Paper for Printing: Today and Tomorrow

Two studies are now being prepared on television, one dealing with the present stage of development of the medium, the other with the international exchange of programs and the effectiveness of such exchanges as a means of increasing international understanding. They will be produced in book form. Some dozen mimeographed papers have been issued and others are being prepared on

such subjects as the use of radio in language teaching, facilities for the training of journalists, films and filmstrips for fundamental education, etc.

Each year the clearinghouse also undertakes one or two special assignments, chosen in relation to the over-all objectives of the organization, for detailed study and implementation in cooperation with member states and professional organizations. Thus, an 18-month study was made of the effects of the Canadian Farm Radio Forum Broadcasts, in cooperation with the Canadian Association for Adult Education and other Canadian bodies. A plan for standardization of methods of cataloguing and evaluating educational films was evolved in cooperation with the National Commissions of the United States and the United Kingdom. By the end of 1954, it is expected that organizations in the major film-producing countries will reach agreement on the standard system.

It is desirable, moreover, that all countries which produce educational films should prepare, for international circulation, descriptive cards and evaluations covering their production, in order to permit full use of these resources for educational purposes. A Conference on International Standards for Film Cataloguing, convened by the United States National Commission for *UNESCO*, recommended that *UNESCO* should seek for agencies in each country best qualified to prepare the material and make arrangements for printing national cards for international distribution; and should also seek methods for housing a catalogue of all the cards of all the nations. The conference also noted that adequate use of the evaluation process would require a manual of instructions, including definitions and examples of terms.

A study of the organization of collective viewing for television and of the use of television of adult education was undertaken in conjunction with the French National Commission and the French television organization. The program of the division attaches considerable importance to the study of the organization and operation of school broadcasting services, and to the exchange of information between press research institutes, provision of bibliographical material, and other similar projects.

A study is to be undertaken on the effect of radio and television on the cultural life of the community. This is to be done on the recommendation of the Committee of Experts on the Right To Participate in Cultural Life. The division will cooperate in the preparatory work for a seminar, being planned by another

UNESCO department, that of Social Sciences, on the use of visual aids in the teaching of the social sciences.

An examination is being made of the general question of the relationship of the broadcaster to his audience. Although broadcasting is now carried on, to a greater or lesser extent, in practically all countries of the world, only a very few countries have developed satisfactory audience research methods. This "one-way-flow" aspect is one of the dangers inherent in the modern methods of mass communication which tend toward the centralization of information, entertainment and culture without sufficient relation to the needs and interests of their audiences. The problem is of special importance for those countries in which broadcasting represents a comparatively recent development, and where methods evolved in the last quarter century in more technically advanced countries tend to be applied without proper regard for the difference in tradition and cultural background.

Therefore, another *UNESCO* study is designed to stress the importance of a close relationship between the broadcaster and his audience. Results of surveys already carried out on the problem, and the organization and techniques of listener research will be covered.

UNESCO's member states have been asked for advice on the structure and scope of an international body to study all problems concerning children and young people in their relation to press, films, radio, and television. It is expected that it will be possible, during 1954, to organize on the basis of the answers received a constituent conference to prepare the statutes and program of such an international body. Although autonomous, the body would need financial help from *UNESCO* to carry out its program.

The instruments of mass communication were developed in the technologically advanced countries and naturally, therefore, the type of civilization in those countries affected the format, techniques, and conventions evolved for the press, film, and radio. The use of these media for the purposes of fundamental education in the technically undeveloped regions is comparatively recent, and there is as yet insufficient knowledge concerning the validity of these techniques and conventions when presented to new audiences.

An international seminar on the use of visual aids in fundamental education was held in Messina, Sicily, during the month of September 1953. It was organized to provide participants from some 30 countries regularly engaged in the production or use of

visual aids in their fundamental education projects with an opportunity to exchange information on their work and to study at firsthand methods used and results achieved in countries where most experience in this form of educational aid has been obtained.

To prepare for the seminar, *UNESCO* sought the cooperation of a dozen agencies working with visual aids in different regions of the world. They were requested to undertake special research on the usefulness of different types of visual materials, and to provide reports for consideration at the seminar. Over 300 films, 200 filmstrips, as well as collections of posters, visual kits, and other visual materials were selected for exhibition and study.

Five specialists were chosen to act as lecturers and discussion leaders on various aspects of the subject, including the problems of production, pedagogical content, the use of visual aids in community development, the economics of production and the training of technicians, the use of visual aids in literacy teaching, and other important topics.

Apart from the general work in full meetings, working groups were set up to consider the application of visual aids to specialized aspects of fundamental education (economy, resources, agriculture and forestry; health, the home and the community, vocational training, craftsmanship and cooperation), and to study problems involved in their production and use (production problems, sources of material, equipment, training of technicians, use of visual aids in a fundamental education project).

To prolong the effects of the seminar, continued work and research is planned, both by the participants on their own national level and by *UNESCO* in its future program.

DIVISION OF FREE FLOW OF INFORMATION

In order that the output of improved technical facilities may be available as widely as possible to the greatest number of peoples, the Mass Communication Department cooperates with the United Nations and its Specialized Agencies with a view to reducing the obstacles to the international free flow of information, ideas, and knowledge; to the international circulation of educational, scientific and cultural materials; and to the movement of persons engaged in activities in these fields.

This is the task of the *Division of Free Flow of Information.* The methods used are: agreements, recommendations and administrative arrangements to establish international standards for

national regulations and practices affecting the free flow of ideas; action in cooperation with appropriate international organizations to promote practical measures for the reduction of obstacles; publications to enlist public, professional and governmental support for remedial action.

UNESCO's member states are invited to adhere to the agreements, recommendations or other arrangements approved by *UNESCO's* General Conference, and to support measures formulated by *UNESCO* in cooperation with the UN family and other appropriate international organizations. And *UNESCO's* Director-General carries out the measures incumbent on the organization in applying and securing the widest possible adherence to the agreements.

The first of these agreements is the "Agreement for Facilitating the International Circulation of Visual and Auditory Materials of an Educational, Scientific and Cultural Character." Adopted by the General Conference in 1948, its purpose is to remove customs duties, quotas and licensing requirements as applied to a broad range of auditory and visual aids to education, such as films, filmstrips, microfilms, sound recordings, glass slides, models, wall charts, maps, and posters. The materials must be certified by the government of the producing country to be of an educational, scientific or cultural character. *UNESCO* acts as the certifying agent for materials produced by international organizations and publishes catalogues of all certificates.

The agreement was opened for signature on July 15, 1949, and nine countries had given their adherence by the middle of 1953. Twelve additional countries had signed but not yet ratified. By the end of 1954, it is expected that the agreement will have received, at least, the tenth adherence necessary for its entry into force.

At the General Conference of 1950, a more comprehensive agreement, prepared by *UNESCO* in cooperation with the Contracting Parties to the General Agreement on Tariffs and Trades in 1949, was adopted. This is the "Agreement on the Importation of Educational, Scientific and Cultural Materials." In addition to the material provided for in the first agreement, it gives duty-free entry to books, newspapers, periodicals, music scores, and other publications; to works of art; to materials for the blind; and to scientific equipment consigned to recognized institutions. The contracting states also grant licenses and foreign exchange for publications destined to public libraries.

This agreement entered into force on May 2, 1952, and was being applied by 15 countries by mid-1953. Sixteen other nations had signed; and it was expected that by the end of next year, most of these, as well as a number of others, would have formally adhered.

The first draft of a third agreement, an "International Instrument for the Free Movement of Persons" engaged in educational, scientific, and cultural activities, was prepared on the basis of governmental answers to a questionnaire and submitted this year to the member states. It is to be presented for definitive adoption to the General Conference at Montevideo during the autumn of 1954.

Also in the field of international arrangements, *UNESCO* has proposed measures to reduce legal, administrative, and technical obstacles; and the responses have been favorable. In order to facilitate the safe and expeditious transit of delicate physical standards, the organization has suggested an arrangement whereby a *UNESCO* label would be put on packages of fragile measuring instruments, permitting them to pass unopened through customs when exchanged between accredited scientific laboratories. Thus far, 17 countries have expressed interest in the arrangement, and 22 laboratories have been named to enjoy its benefits.

The second method of the "free flow" division—practical cooperation with the UN and other international agencies—is exemplified by help given to the Rapporteur appointed by the UN Economic and Social Council in drawing up a thoroughgoing report on problems and developments in the field of freedom of information.

This report concludes with a series of draft resolutions in which the Council would request *UNESCO* to carry out a wide range of specified activities such as the preparation of a report on the possibility of an international convention concerning the use of broadcasting in the cause of peace; a study of copyright problems affecting the information media; and a report on a program to assist the work and travel of foreign news personnel. The Council, at its Seventeenth Session in 1954, is also to consider a report prepared by the UN in conjunction with *UNESCO*, which recommends that the Council request *UNESCO* to undertake a programme of action to assist in the development of domestic information enterprises.

Cooperative arrangements have been established with the three UN Regional Economic Commissions in an effort to increase the availability of educational, scientific, and cultural materials. More-

over, the attention of the Transport and Communications Commission has been brought to the opportunities for reducing obstacles to the free movement of persons engaged in educational, scientific, and cultural activities.

A series of proposals is to be sent to member states for possible submission to the International Telegraph and Telephone Conference, scheduled to be held in 1955. These proposals, carrying forward action taken at the preceding conference in 1949, will seek to promote the international transmission of news by means of improved communication facilities and reduced rates for press communications.

In 1952, *UNESCO* recommended that member states lend support at the Buenos Aires Plenipotentiary Conference of the ITU to proposed amendments to the International Telecommunication Convention designed to promote freedom of information. *UNESCO* was represented at the Conference; and a certain number of amendments were adopted. Also in 1952, *UNESCO* commended to member states a series of proposed amendments to the Universal Postal Convention for submission to the Thirteenth Congress of the Universal Postal Union. The Congress adopted a number of these amendments, which were designed to promote the wider use of postal communications for the free flow of information. In 1953, in response to a communication from *UNESCO*, a considerable number of member states reported that they were giving effective application to the amendments of interest to *UNESCO* adopted by the Thirteenth Congress.

In 1953, the International Air Transport Association, at the request of *UNESCO*, placed on the agenda of its annual meeting, which fixes international rates for air transport, the question of possible reductions in air freight rates for educational, scientific, and cultural materials. *UNESCO* is also initiating research into the prospects of obtaining concessions for educational materials sent by ship, paralleling the concessions which will have been secured in the field of air transport.

At the International Publishers Congress in 1954, the first such congress to meet in seven years, *UNESCO* will submit information on its work to reduce obstacles to the international circulation of books, together with proposals for joint action on the part of the Congress and *UNESCO*.

In the field of publications, to enlist support for measures to promote the free flow of information, an essential feature of

UNESCO's activity is the preparation and publication of studies designed to focus the attention of the public and the professions, as well as governments, on obstacles to the free flow of information and on the remedial measures required. Thus, of past publications, *Trade Barriers to Knowledge* served effectively to promote adherence to the *UNESCO* Agreements; and *Transmitting World News* stimulated widespread interest in proposals for improved facilities and reduced rates for press messages.

DIVISION OF VOLUNTARY INTERNATIONAL ASSISTANCE

The *Division of Voluntary International Assistance* is entrusted with the operation of two systems of international communication which, through the use of *UNESCO* "Coupons," are intended to permit the fuller and freer circulation between countries of many of the materials of education, science, and culture, including for example audio-visual aids.

The first of the systems, the *UNESCO* Coupon Scheme, was inaugurated in 1949 as a means of removing some of the difficulties impeding the free international circulation of publications, such as those created by foreign exchange regulations and by the shortage of "hard" currency in "soft" currency countries. The *UNESCO* Coupons, constituting a series of international currency and backed by dollar resources, made it possible for a person in a "soft" currency country to pay in the money of his own country for a book or publication which he wanted to buy in a "hard" currency country. In 1950, the scheme was extended to include not only books and publications but also films and scientific equipment. At present, 32 countries are participating in the scheme. About $4,000,000 worth of Coupons have been issued, and they are being redeemed at the rate of about $100,000 worth every month.

The second system, the *UNESCO* Gift Coupon Program, is operated for the financing of gifts of an educational, scientific, and cultural character; for the establishment of direct relations between donor and recipient organizations; and also for the spread and development of knowledge of and participation in the purpose of the United Nations and of *UNESCO*. It had its inception during 1950 after a decline in voluntary donations for educational rehabilitation in war-devastated countries had become evident. Procurement and transportation problems in sending gifts abroad had increased, and certain urgent needs, such as for audio-visual aids and laboratory equipment, were being neglected.

The United States National Commission for *UNESCO* agreed in December 1950 to launch the scheme on an experimental basis, and in November 1951 pronounced the trial period a success and endorsed the scheme. The method is for persons and organizations in "donor" countries to buy Gift Coupons which are used to provide the funds necessary for specific purchases of needed materials in recipient countries. By the middle of 1953, 11 "donor" countries were participating, and more than 30 were recipients. Preparations were under way to introduce the scheme in four more donor countries, and more than 500,000 persons had already participated in the exchanges.

USE OF THE MEANS OF COMMUNICATION

Under the general heading, *Use of the Means of Communication,* three divisions seek to stimulate and encourage the use of educational, scientific, and cultural materials by the mass media. Such stimulation may take one of two forms; stimulation through personal contacts with newspaper and periodical editors, film producers and broadcasters, and through the supply to them of raw materials susceptible of being converted into news items, and articles, film, scenarios and films, radio programs and features; and supply to the same outlets of finished productions, articles, films, radio scripts, and records for direct use by the recipients.

Certain press, film, and radio organizations have no facilities for supplying the public with output of an educational, scientific and cultural nature, and require a finished product. Others, receiving from *UNESCO* modest quantities of material to serve not as models but as samples of what can be achieved, integrate them into their own output and build around them series of articles, films, and broadcasts. Still others, while not requiring finished productions, use the ideas and suggestions contained therein and in background documents for the elaboration of their own output.

PRESS DIVISION

The impact of *UNESCO* on world opinion depends to a large extent upon the means of communication at *UNESCO's* disposal and upon the cooperation of organs of the press and radio throughout the world. If *UNESCO's* work is to be understood, it must be reported. One of the major tasks of the *Press Division* is to help bring about the full and accurate reporting of *UNESCO's* own activities, and also of general activities in the field of education, science, and culture.

With *UNESCO* based in Paris, which is itself a major news center, the division maintains regular and permanent contacts with the foreign correspondents in Paris and seeks to become fully acquainted with their interests and those of the newspapers and periodicals, both general and specialized, which they represent. There are more than 400 of these correspondents who follow *UNESCO's* work, with 213 of them formally accredited throughout the year.

During conference periods this number increases by over a hundred, and the most spectacular aspects of program and budget find their way into the columns of the world's press. However, in the intervals between conferences and specially convened seminars or meetings, the attention of the press has to be attracted. This is done by following the day-by-day work of the various *UNESCO* departments and deciding on the best aspects to be exploited and the best means of exploiting them. Monthly calendars of meetings are distributed, releases and special articles keep correspondents and editors abreast with the latest developments, press conferences are organized, and up-to-date files are kept on all questions to be placed at the disposal of visiting journalists. With these files and personal knowledge, press officers are able to give a general background picture, but refer the correspondent to program specialists for more detailed and technical information.

Press officers are also sent to meetings and seminars held away from headquarters to organize local coverage and to seize the opportunity of a specific manifestation to make the work of *UNESCO* in general better known in that particular country. Personal relations are developed by correspondence with the editors of newspapers and periodicals in all *UNESCO's* 69 member states, as well as in some countries and territories which, though not members of *UNESCO*, show an interest in its work. These contacts, plus a careful scrutinization of the press cuttings which come in daily form the basis for up-to-date mailing lists which indicate the interest, space, and tendencies of the press throughout the world.

Distribution of both press material and publications for review purposes is an intrinsic part of press relations. Mailing lists are classified under various headings such as: natural science, political science, youth, and education, as well as under countries. A selection is made from among these lists, taking into account regional interests, previous reactions, the availability of review copies in the case of publications. The language difficulty has also to be taken

into consideration as *UNESCO* works in three official languages—English, French and Spanish—but also distributes newsletters and releases in German, Arabic, Urdu, Hindi, and Dutch.

There are about 6000 publications on the regular mailing lists, which do not include the press of certain countries where special arrangements have been made for local distribution. Decentralization either through national news agencies or a national cooperating body presents the advantage of providing greater concentration locally and of simplifying work and lessening expense at the Secretariat. In certain countries, such as Sweden, Norway, Denmark, Germany, Yugoslavia, Japan, the Netherlands, Italy, and Austria, *UNESCO* material is translated, adapted to local needs, and distributed in this way. Material is sent in bulk to a press officer engaged by the Ministry of Education in Great Britain for redistribution, and a similar arrangement operates in the United States where, however, material is reproduced locally.

To take the 12-month period of July 1952 to July 1953 as an example of direct distribution from Headquarters:

279 press releases sent in English and French to 57,127 addresses
82 press releases sent in Arabic to 8840 addresses
160 press releases sent in Spanish to 33,600 addresses.

About 23,000 copies of 136 books and pamphlets published by or for *UNESCO* during the year, were sent out for review purposes; over 42,000 people received the handouts describing their contents. This latter service enabled persons who had an active interest in the subject to apply for review copies. Press clippings received increased from 31,000 in 1948 to 54,555 in 1952 and this corresponded only to the 28 countries in which *UNESCO* has a clipping service. Apart from written material, over 2500 photographs were distributed either singly or as picture-stories placed with illustrated magazines during the 12 months under review.

The Division issues *UNESCO Features* a fortnightly service distributed to newspapers and periodicals in all parts of the world —approximately 3400. It is originally produced in English, French, and Spanish, but articles and items are often translated locally and have been published in Afrikaans, Arabic, Benghali, Chinese, Danish, Dutch, German, Hebrew, Hindi, Indonesian, Italian, Norwegian, Persian, Portuguese, Singhalese, Swedish, Tamil, Urdu, and various other languages. Clippings of *UNESCO Features*

material have been received from 1423 different publications, with a total circulation of about 40,000,000 readers.

The types of publications using the service are varied. They include small provincial and colonial newspapers, about half of which are weeklies or semiweeklies; educational journals, labor publications, trade papers, house organs, and other special periodicals, most of which are weeklies and monthlies; and metropolitan daily newspapers.

The *UNESCO Courier*, also issued by the Division, is published monthly in three language editions, English, French and Spanish. It offers a selection of illustrated feature articles and news, photographs and graphs relating to the educational, cultural, and scientific problems and life of peoples throughout the world. It provides for readers in more than 70 countries information of common appeal for teachers and citizens alert to international events and problems.

Every month the *Courier* devotes a section of its issue to an authoritative treatment of an important world problem and shows how it is being dealt with nationally and internationally in various parts of the world. Recent issues have featured such themes as: "The Intellectual Fraud of Racial Doctrines"; "Education of Young People Through Art"; "Human Problems of Technological Change"; "Public Libraries and Popular Education"; "The Social Upheaval in the Middle East"; "Children and International Understanding"; "Television, A Challenge and a Chance for Education"; "The Cinema and International Understanding"; "The Growing Struggle Against Illiteracy"; and "World Newsprint Famine."

RADIO DIVISION

The use of radio on the international scale presents problems which are different from those encountered by broadcasters at the national level.

The local broadcaster is closer to his listeners and can more easily adapt his program to his audiences' preference, but he lacks certain sources of program material which are only available to the international broadcaster. The latter therefore must constantly be in close contact with the local broadcaster, who is the final judge of the quality and impact of every program. Listener research on the international scale is all but impossible, and the international broadcaster must therefore depend on the opinion of local broadcasting stations for knowledge of the value and impact of his

programs. It is they who will tell him whether he is achieving his purposes or not.

The *Radio Division* does not, strictly speaking, broadcast on the international scale. The Division has a transcription service, and is therefore entirely dependent on the cooperation of local broadcasting stations for the transmission of its programs. By using transcriptions, *UNESCO* manages to get on the air and reach much larger audiences than if it depended on a regular short-wave international broadcasting service.

At present, *UNESCO* broadcasting material is being used in over 80 countries and territories on medium- or long-wave stations. These are the transmitters that reach the masses, the short-wave audiences being limited by the cost of receivers and the very fact that short-wave listeners, in most countries constitute a very small percentage of the total listening audience. In *UNESCO*, the problem of reaching the masses through radio has therefore taken the form of an international transcription service.

What is the nature of the program material produced and distributed by *UNESCO?* In the early stages there was very little precedent in the field. For the past four years, the Division has made it a primary task to ascertain the requirements of each country, and indeed of each region within a country. In some parts of the world these requirements vary widely from one sector to another.

Insofar as possible, local requirements are being met. There is no such thing as an international, or even a local common denominator, but by establishing close relations with radio producers and directors locally, it is possible to produce suitable programs and program material from the vast international sources available to an organization such as *UNESCO*. This is the prime task of the Division.

UNESCO has thus established liaison with over 250 stations and networks, and a certain number of these are visited every year by members of the headquarters staff. Over 6000 copies of approximately 900 recorded programs are distributed each year. These take the form of interviews, talks, commentaries and particularly 15- to 30-minute features. The latter have had very wide acceptance.

In some countries, like Australia, a single copy of the program is sent to a local agency, such as the National Commission for *UNESCO*, and it is there copied and distributed locally to as many stations as have expressed the wish to broadcast the

program. In others, the distribution problem is not so easily solved, particularly where long distances make the shipping cost by air almost prohibitive. In Latin America, for instance, distribution has been limited to the fifty largest and most cooperative stations available, and the programs are processed in 10- and 15-inch microgroove vynalite records, which weigh about 200 grams. These records carry, according to size, two 15-minute or two 30-minute programs each, at considerably reduced cost.

At present, practically all the feature programs are produced in English, French, or Spanish, but talks and a few interviews have been recorded in over 20 languages, and the scripts of the features, together with recordings of the bridge music and sound effects are sent to stations using other languages for local production. This has been the most effective way of overcoming the language problem.

The limitations placed on recorded productions necessarily implies a limitation of distribution to the most effective outlets available, and it also means that many potential broadcasters of *UNESCO* material cannot be serviced. In order to fill the gap, a weekly radio bulletin, the *UNESCO World Review* is distributed to a much larger number of stations in English, French, Spanish, and Arabic. This bulletin is particularly useful because it offers a means of getting material broadcast in certain countries which would otherwise have little or no material at all, and through stations in certain regions which are not within the radius of the stations using the recorded material. Furthermore, this bulletin is also used as a complementary program, or as a source of program material by many stations.

The transcription form is eminently suitable to the purposes of *UNESCO* because it is not a "news-making" Agency. Most *UNESCO* material can stand the delay consequent to transcription, dubbing or pressing, and shipping, without losing its appeal. In this way, *UNESCO* is different from UN, where a transmission service is imperative. There day-to-day events must be aired while they are still news. However, during a *UNESCO* General Conference, or during some important meeting or ceremony, the *UNESCO* radio division uses lines or the cable services to get its reports quickly to important networks or stations.

In addition to the production activities of the Radio Division, a major preoccupation of the division is the stimulation of programs carrying out the aims of *UNESCO* by the local radio stations in member states. Members of the staff visit radio organizations to

establish contacts, exchange ideas and study local requirements and to insure that *UNESCO* programs, through local translation and adaptation, have the widest dissemination.

FILM AND VISUAL INFORMATION DIVISION

The *Film and Visual Information Division* has three main tasks: (a) it maintains direct contact with film producers in many countries, suggesting subjects to them and furnishing material intended to stimulate the production of films on subjects related to *UNESCO's* program and to activities in the general field of education, science, and culture; (b) it furnishes films and filmstrips to the National Commissions for *UNESCO* in member states; (c) it exchanges among newsreel companies footage devoted to events of world-wide interest in the field of education, science, and culture, especially in fundamental education.

Between 1950 and 1953 the following films were produced directly by the *UNESCO* Film Division:

The Mondsee Seminar on Adult Education
The Task Ahead (About *UNESCO's* general activities)
Introduction to CREFAL and *New Horizons* (describing the activities of the Regional Center of Fundamental Education for Latin America at Patzcuaro, Mexico)

In addition, a one-hour film, titled *World Without End* intended to describe and explain the activities of the Specialized Agencies of the UN, was produced by Basil Wright and Paul Rotha. It had its world premiere at the Edinburgh Festival in September 1953, and is being distributed in three language versions, English, French, and Spanish.

The Division has also produced a number of filmstrips: six on the rights of man, one on the race question, two on fundamental education. These filmstrips have been distributed to National Commissions of *UNESCO*.

Another important aspect of the Division's work is the activity of a film library which it maintains. This now includes about 500 films which come from different member states. They have been entrusted without payment to *UNESCO* by their producers so that they may be placed at the disposal of experts in education, science, and culture for consultation. If a specific film proves to be especially interesting to an expert or research worker, the Division puts him in touch with the producer in order to enable him to find out more about the subject. In some cases, films are lent

to seminars organized by *UNESCO* in places outside the Paris headquarters.

The Division furnishes film material to the international centres of scientific cooperation maintained by *UNESCO's* Science Department in various parts of the world, and it works closely with the Education Department in the evaluation and exchange of films relating to fundamental education.

A descriptive catalogue of the film library was published in 1951. A new edition, now being prepared, will include valuable additions made by Coronet and Encyclopaedia Britannica Films in the United States, and Gaumont British Instructional, Ltd., in the United Kingdom, in the field of educational films and scientific popularization.

A photo library is maintained in connection with the tasks of visual information. It provides photographic material needed by *UNESCO* for many of its activities, notably with the press, publications, and for exhibitions. All the photographs belonging to the organization—and the number is steadily increasing—are classified, catalogued, and indexed. In addition to furnishing photographs from its own library to the press, the Division obtains photographs for this purpose from member states.

Missions have been sent by the Division to various countries in which special *UNESCO* activities are being carried out, in order to gather photographic documentation. In addition, agreements have been made with many ethographic and other scientific expeditions and missions, with the purpose of gathering photographs not only about fundamental education but also about popular traditions and folk art.

The exhibition section of the Division organizes visual presentations in support of the programs of *UNESCO* and the UN, within the framework of activities of the member states. This year the main subjects of these exhibitions are the struggle to reclaim the desert and jungle for human use, the human value of films, and similar topics. In addition, all of the resources of the Division are used to make known and to support the Universal Declaration of Human Rights throughout the world.

COLOR TELEVISION AND EDUCATIONAL TV

•E. G. SHERBURNE, JR.

What effect will color TV have upon educational TV programs? How expensive will color TV be for educational use? How will educational TV stations use color TV? What competition will commercial color TV offer to educational black and white TV stations? These questions are answered and an overview of the implications of color for educational TV is presented. E. G. Sherburne, Jr., was formerly Television Coordinator at the U. S. Navy Special Devices Center, Port Washington, Long Island, New York.

COLOR TELEVISION provides a picture of the approximate quality of Kodachrome motion picture film on a receiver more complicated and expensive than present home receivers. Within five years, it is predicted that a large number of TV stations in the United States will be broadcasting in color. What questions do these developments raise for educational TV?

BROADCAST COLOR TELEVISION

As education has 242 channels which can be used for either black and white or color TV, broadcast color television is of considerable interest. Here are the characteristics of the medium which are most pertinent to this discussion:

1. *FCC Regulations:* Broadcast color TV operates under FCC regulation. This determines its other characteristics to a considerable degree, as any broadcast color TV equipment has to be designed and operated so as to satisfy both general criteria of performance and technical standards set up by the FCC.

2. *Compatibility:* Broadcast color TV is compatible with the present black and white signal. This means that existing black and white receivers can receive a black and white version of a color

picture without modification to the receivers. In other words, black and white receivers will not become obsolete with the advent of color. A color receiver will reproduce either in color or in black and white, depending upon the signal. Thus, any telecast will be received in at least black and white, regardless of what type of receiver is used.

3. *Color Fidelity:* The quality of the color TV picture approximates that of Kodachrome motion picture film, at least to the average viewer. Experts point out that this means that a picture tends to be pleasing rather than truly accurate in its reproduction of a scene being picked up. In general, colors appear more saturated and brighter than normal, which means that the color of something like a bright red dress can easily be so exaggerated that it is almost unpleasant to look at. Less brilliant colors come through very well.

4. *Complexity:* Broadcast color TV equipment is extremely complex, even compared to black and white equipment. The RCA color camera, for example, has three image orthicon tubes compared to the single one in a black and white camera. In essence, this means that it is three cameras in one, with three times as much circuitry. This additional complexity is present in varying degrees in all color equipment, including receivers. Of course, it will be reduced as development proceeds; but in the foreseeable future, color TV will use more complicated equipment than black and white TV.

5. *High Cost:* Color TV equipment is also considerably more expensive. The RCA color camera costs at present about three times as much as a black and white camera. In production, it will probably go down to around twice the price. Color receivers are also expensive, with initial cost estimates being around $1000 for a 14″ set. Receiver prices will also go down with quantity production, but they will cost more than black and white receivers for some time to come.

6. *Technological Changes:* If anything is certain, it is that color TV will undergo radical technological changes. This will result in improved picture quality, less complexity, lower cost, etc. In addition, such new developments as the video tape recorder for recording and playing back color TV programs will come into use.

QUESTIONS FOR EDUCATIONAL TV STATIONS

There are many questions that could be asked about broadcast color television. Some of the most important appear to be the following:

Will the addition of color to telecasting increase the effectiveness of educational programs?

There is little information bearing directly upon this subject. In perhaps the closest thing to a study of color TV, Jackson compared the effectiveness of a color film (which a group of trainees thought was a color kinescope recording) to a black and white film (which another group of trainees thought was a black and white kine). The learning of the two groups did not differ significantly. While this experiment is not conclusive, it does suggest that color may not necessarily be more effective than black and white.

Research in film tends to support this. In general, it indicates that color in films is not important unless it is necessary to understand what is being seen. In other words, cues such as texture, shape or size may be communicated adequately in black and white. In such an event, color would be unnecessary, and might even be more of a distracting influence than an aid.

Warnings have also begun to appear about overestimating the value of color in entertainment TV. Jack Gould, radio-TV editor of the *New York Times,* recently stated that "the novelty of color can wear off quickly and . . . the acid test of the medium will be the same as in black and white—how good is the show? . . . The play, not the hue, is still the thing."

On a more theoretical basis some psychologists argue that color vision is a relatively recent development in the evolution of man. As a result, they feel that color is not as important to seeing (and consequently to visual learning) as brightness differences or other visual cues.

In conclusion, it seems logical to doubt any claims for color TV of generally increased effectiveness in teaching, at least until more research is available. Educational TV should be able to do just as good a job in black and white TV for almost any subjects that would be required.

What effect will the introduction of color have on television programming?

The use of color would appear to provide two advantages over black and white for programming: (a) colors can be shown instead of being described verbally, and (b) differences between colors of equivalent brightness show up, instead of blending together as the same shade of grey.

It is questionable whether these two advantages will allow many completely new types of programs to be created. It is more

probable that many existing types of programs will be strengthened through the addition of color. The greatest impact will be for what might be termed "marginal" programs, ones which are of only limited appeal in black and white TV.

Special events programming is a good example, and is one which commercial TV feels color will help a great deal. The Tournament of Roses, Mardi Gras festivities, etc., will be much greater attractions in color than in black and white. In addition, such programming areas as fashion, cooking, and interior decoration will probably receive greater emphasis on color TV.

For education, the effect will also be to strengthen marginal programs rather than to introduce new program types. One of the most significant areas may well be in art. Programs on the appreciation of paintings, for example, have not been too successful in the past. This is perhaps because the colors in paintings are important to their understanding and enjoyment. Color TV should go far to eliminate this problem. In fact, the prediction has been made that color TV would popularize art in the same way that radio has popularized classical music.

In general, it may be concluded that color television will not cause any radical changes in programming structure. It will probably serve to increase the emphasis on what are now marginal programs, making them better able to compete with more popular types such as drama or musicals. It will also strengthen the latter types, but to a lesser degree.

Will stations telecasting in color have a competitive advantage over stations using black and white TV?

An important aspect of color television will be its "audience-capturing" potential. If color programs are more attractive per se than black and white programs, this will provide a considerable advantage to color stations in competing for an audience.

The first aspect of this problem is when it could be of importance. There is general agreement that at the most, only several hundred thousand color TV receivers will be manufactured in 1954. Therefore it will be at least 1955 or 1956 before color set ownership is large enough to be of importance.

It is probable that when a family first has a color TV set, color programs will have a strong attraction because of the novelty. There is little information available as to whether or not this attraction will remain. Film research indicates that students like color films better than black and white films, but there is no way of telling

whether this would carry over to the selection of TV programs. In advertising research, it is generally accepted that color ads are noted by more readers than black and white ads. Again, there is no indication as to whether there would be a carry-over.

Jack Gould, in the previously quoted article, gives his opinion that "a viewer of color TV cannot avoid one inescapable conclusion. If the quality of the color TV program is either second rate or not to individual taste, the set owner indicates no reluctance to turn color off and look for something better in black and white."

Any competitive advantage for color stations will probably come from the fact that they have stronger marginal programs rather than from any basic appearance of color alone. As these programs for the most part are not the type to pull large audiences, this advantage will not be a great one from a total audience point of view. However, it will enable commercial color stations to carry a wider variety of programs, and this should give them a sales advantage over commercial competitors still using black and white.

For educational stations, operating in black and white, the importance of the problem may depend upon what size audience a station feels is necessary. If it is operating on a "minority audience" basis, color TV competition will not be serious. If it is operating on a "majority audience" basis, in direct competition with commercial TV stations, then the possible competition from color TV might be a threat.

It may therefore be concluded that color will be more important competitively to commercial TV than to educational TV. Because of the lack of information on the subject, little more than this can be said.

Will the cost of color television be a serious problem for educational TV?

Color television costs more than black and white television in every respect. Studio and transmitting equipment is more expensive, and requires more highly skilled personnel for operation. Receivers are also more expensive, and require better installation and maintenance. Program production is more complex, and will require more skills than black and white production.

Although equipment and receiver costs will go down with quantity production, color TV will cost considerably more than black and white in the foreseeable future. Production will also remain more complex and difficult.

With the present difficulties in financing black and white educational TV, it would seem that color TV would only impose additional money problems. If the advantages of color TV for education were more clear cut in regard to effectiveness or circulation, color TV might be used. As it is, the best course seems to be one of caution. Commercial TV will of necessity do considerable pioneering in color in the next few years. Educational TV can then decide whether the advantages of color are worth the additional cost.

CLOSED CIRCUIT COLOR TELEVISION

Closed circuit color television is also of interest to education, though probably not on the same scale as broadcast color. Closed circuit TV can be broken down into two general types: (a) local closed circuit TV, which can be defined as that with coverage limited to a single building or group of buildings, and (b) network closed circuit TV, which involves transmission between two or more cities, and which normally uses big screen projection sets in theatres or auditoriums.

Although broadcast type equipment could be used in closed circuit color TV, it is more common to use one of several other color TV systems having non-broadcast standards. These systems have the following characteristics:

1. *No FCC Regulation:* Because it is not broadcast, closed circuit color TV does not fall under the jurisdiction of the FCC. This means that it does not have any of the standards limitations of broadcast TV. Any one of a number of systems can be used, involving differences in color pickup methods, band width, etc. Some variation of the CBS system is generally used.

2. *Non-Compatibility:* Closed circuit color TV is usually non-compatible with present black and white receivers. This means that present receivers cannot receive a black and white version of the color picture without modification. With some systems, these receivers can be converted to receive color through the addition of a color wheel.

3. *Color Fidelity:* Because of the variation in systems, the picture quality varies more than with broadcast color TV. With one system, it is perhaps as good as Technicolor motion picture film. On the average, it is probably more like Kodachrome film—and occasionally, considerably worse.

4. *Complexity:* Closed circuit color TV equipment is more complex than equivalent black and white equipment. It is generally

not as complex as broadcast TV equipment. Big screen projection receivers are, of course, much more complex than direct view receivers.

5. *High Cost:* Equipment is more expensive than equivalent black and white equipment. It is generally not as expensive as broadcast color TV equipment. Again, big screen projection receivers are much more expensive than direct view receivers.

6. *Technological Change:* Closed circuit color TV can be expected to change and be improved as rapidly as broadcast color.

QUESTIONS ON CLOSED CIRCUIT TELEVISION

Much of what has been said about broadcast color TV can also be applied to closed circuit color TV. Two questions might therefore be asked:

Can education use local closed circuit TV?

In general, local closed circuit color TV will not be too important for education. In certain specialized cases, such as medical teaching, it will be of great importance.

In the cases where it will be used, the value will come from the fact that color is important to the teaching. For example, in medical education, color is necessary to identify certain pathological changes essential to diagnosis. It is also of great value in surgery, dermatology, etc.

Local closed circuit color has another possible application: teaching students majoring in the study of TV. In view of the cost of broadcast equipment, it would seem logical for colleges to purchase closed circuit equipment instead. This could be used for teaching color TV programming and production—lighting, set design, etc.

Can education use network closed circuit color TV?

This type of television would appear to have an extremely limited application for education. It has been used in medical education in a limited way and in non-teaching situations, such as sales meetings. Because of the cost, it is doubtful that it will find any widespread use in the immediate future.

CONCLUSIONS

Color television is so new that there is little concrete information on the subject. However, it seems logical to doubt that color will provide any general increased effectiveness to educational TV.

In some areas, such as art and medicine, the impact may be great; but for the greater proportion of educational subjects, it will not contribute a great deal.

In view of this, together with the present high cost of color TV, it would seem foolish for educational TV to delay development because color television is coming. The transition to color can always be made after the pioneering is done, when costs have gone down, when color receiver circulation is large enough to make color worth while, and when the numerous problems of color programming and production have been solved.

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THE TEACHING FILM OF TOMORROW

•ROBERT W. WAGNER

This penetrating prediction of the teaching film of the future is adapted by permission from the January 1954 issue of "The Newsletter" of The Ohio State University. Robert W. Wagner is Assistant Professor and Director of Motion Picture Production, Department of Photography at The Ohio State University.

The 16mm film, introduced thirty years ago, removed important economic and technical barriers to the use of motion pictures in education. Today, the teaching film is cinematically professional and academically respectable.

From the experience and experiment of the past thirty years has also come a number of valuable concepts which have changed the nature of the teaching film and which give us clues as to what the teaching film of the future might be like. We are, for example, developing new concepts of how people "see," based on a recognition of the fact that the film itself is only a part of the total film situation, and that while seeing may result in believing, seeing is also conditioned by what the audience already believes. The teaching film of tomorrow will be based on a better knowledge of the physiology and psychology of how people look at pictures.

A related concept is that of the "target audience." This is the theory that film effectiveness is proportionate to the degree to which the picture satisfies the needs and interests of a specific group of individuals. Classroom films of the future will be tailor-made to fit the age, grade-level, and interests of their intended audience.

Another developing concept is the necessity of collaboration between film producer and educator in the production of motion pictures designed to meet the demands of the school curriculum.

This procedure is making it possible to plan motion pictures to integrate with textbooks, filmstrips, recordings, and other teaching materials on the same subject matter. As a result, the teaching film of the future will be a part of a battery of experiences in a better planned, better coordinated pattern of utilization.

The necessities of modern education have given rise to the concept that good teaching techniques may be built directly into films designed to meet the emergency requirements of rapid mass learning. While good utilization by a capable teacher improves the chances of learning from a motion picture, a good film can often do a better job than a poor teacher. In the past it has been possible, where necessary, to impart information and to develop fundamental appreciations and understandings through books alone. The teaching film of the future may be expected to function in situations where qualified teachers are not available or, as in the case of some adult education programs, where there may be no teacher at all.

The well-designed teaching film of tomorrow, based on an improved knowledge of how people learn, will be simple without becoming oversimplified, accurate without becoming pedantic. The narration will be written with the vocabulary level of the audience clearly in mind, but it will be recognized that what is said is seldom as important as what is seen on the screen.

Increased use of dialogue interspersed with narration will tend to extend film length, but the pace at which the film proceeds will thereby be reduced. The film of the future, unlike many teaching films of the past, will not contain too many ideas nor move too fast. The major consideration in film length will not be the capacity of a 16mm reel or the time between the ringing of two class bells, but the nature of the learner, the nature of what is said, and the best way of saying it in film form. The teaching film of the future, like Lincoln's legs which were "just long enough to reach the floor," will be just long enough to reach the audience for which it is intended.

More use will be made of the introduction which clearly and succinctly poses the problem, orients the audience, and establishes "set," or a condition of readiness and anticipation for the presentation. Key ideas may be repeated two to four times in a film for added emphasis and reinforcement, but the repetitions will be varied, and aesthetically satisfying as well.

Color, music, sound, animation, optical and special cinematic effects will be used more discriminately, more selectively. The possible and as yet unmeasured subliminal effects of these elements will be better understood and exploited. Combination of live photography and animation presently found in a few films like *Over-Dependency* and *Human Reproduction* will be more common. The direct, simple, succinct approach found in many television shows will influence the classroom film as television films and kinescope recordings are made available to the schools.

The teaching film of the future will be based on the recognition of the film experience as an active, not a passive one. A degree of audience involvement will be accepted as essential to every form of teaching film. To secure such involvement, more use will be made of dramatic structure, suspense, and devices built into the film to encourage audience participation, overt and covert.

Films of tomorrow will be deliberately designed to stimulate thinking, to change behavior, and to bring about that sense of participation and sharing which characterizes successful communication and effective learning. Teaching films will, accordingly, be more than an accumulation of facts. They will be provocative and challenging. There will be more "forked-road" situations, and more use of the "open ending."

Richard Griffith, describing Flaherty's *Louisiana Story*, points out that "a real educational film . . . is also a poem, and the two things go together." The teaching film of tomorrow will be an aesthetic as well as an intellectual experience. It will help pull our fragmentary world together, and present problems in ways which involve the response of the whole learner without isolating the intellect and emotions.

The art of putting words and images together in motion picture form is still in its infancy. While we know a good deal about the effects of film in education, we still know very little about the reasons for those effects. Basically, we have little knowledge of how pictorial-verbal symbol systems function in the whole process of communication. From film experiences with young children, and with primitive adult audiences, it appears that one must learn the language of film. Close-ups may give young children misconceptions of size. Dissolves, fades, and other optical effects may be unintelligible to the film illiterate. A former British films officer in Nigeria reports that some African tribes could distinguish color

films from black and white only by identifying the former as the picture "where the sun was shining."

Makers of educational films have been mainly occupied with illustrating words, with trying to reproduce reality, to picture the world as they and perhaps a few educators see it. One of the next stages in educational film production may well be the use of the more interpretive and symbolic powers of the film based on a detailed study of the perceptual background of the specific audience for whom the film is intended.

The educational importance of the three-dimensional film, or the wide-screen picture with stereophonic sound, for example, may not be in terms of what is currently advertised as "greater realism," but rather in greater symbolism. By amplifying and extending reality, these techniques may make the film experience more "real" than real, throw new light on the commonplace, and capture the deeper significance of a situation or an event. The basic importance of a good motion picture has always been that while it cannot substitute reality, it can isolate and intellectualize meanings not always evident in a first-hand experience.

The teaching film of the future will be the product of more responsible film makers, improved techniques of film making, better systems of distribution, and more intelligent utilization. It will be the result of a better understanding of how specific groups see and interpret audio-visual symbols in motion picture form. Such films will not be evaluated in terms of how the professional film maker sees them, nor solely on the prejudgments of a select group of teachers or critics, but on the way the intended audience reacts. Since film learning does not follow the classical Ebbinghaus curve of forgetting, such reactions will be noted not only during and immediately after the showing, but also a month or several months later.

Tomorrow's teaching film will grow from future developments in the whole field of education. It will improve with advances in our knowledge of how people learn, with better qualified teachers, and more forward-looking school administrators. It will be not only a product of inevitable change in our educational system and our society, but also a means by which to direct the course of that change. The good educational film of the future may help create a climate in which we may have not only better teaching films, but also better textbooks, better educational radio and television, better schools, better teaching, and, in the end, a better society.

BOOK REVIEWS

VERNON, M. D. A Further Study of Visual Perception. London: Cambridge University Press, 1952. 289 p.

Reviewed by

•**FRANKLIN FEARING**

A Further Study of Visual Perception is an important contribution to the current debate[1] regarding the relative merits of what Professor Gibson has recently called the "stimulus oriented" and the "action and purpose" theories of perception. In his recent book, Gibson defends the former theory and suggests that the enthusiastic proponents of the latter need to remember that all human beings everywhere "probably see the ground and the sky in the same way."[2] They see it, that is, in terms that are uncontaminated by *individual* purposes, values, or attitudes. They see it, so to speak, as it "really is." This is "stimulus oriented" or "literal" perception. In contradistinction Vernon presents an exposition of the view that perception neither mirrors the external world in any exact way nor is primarily determined by factors operating in the sense organs or peripheral nervous system. Rather, the sensory data resulting from the impingement of various types of energies (light "waves," sound waves) coming from external stimuli (objects, for example) on the sensory surfaces are organized and, in a sense, transformed by the individual in terms of his past experience, needs, and motives. The underlying dynamic principle of this transformation is the individual's need to carry on his business of living in an environment which appears to be

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[1] See Professor Norberg's review of Professor Gibson's *The Perception of the Visual World*, and his reply, this journal, Vol. 1. no. 3, 1953, p. 190. Also Norberg's reply to Gibson in this journal, Vol. 1, no. 4, 1953, p. 272.

[2] Gibson, J. *The Perception of the Visual World*. Boston: Houghton Mifflin, 1950. 212.

stable, consistent, and persistent. In other words, he *perceives*, not a shifting world of unrelated colors, sounds, light and shade, but a relatively stable world of objects, forces, or people which are familiar or unfamiliar, threatening or friendly, pleasant or unpleasant. To do this he utilizes various schemata or frames of references which he has constructed. These are brought to bear on various types of situations in such a matter as to enable the individual to act effectively and satisfyingly.

There are two important consequences of this type of perceptual theory. In the first place it asserts that the percept of the external world which the individual constructs is not necessarily "like" the external world, and, in fact may differ sharply from it; and secondly, it asserts that an important group of factors which determine the perceptual process are peculiar to the individual, "subjective," and related to his particular need-motivational system. Such a theory does, in fact, cast doubt on Professor Gibson's assumption that all human beings everywhere perceive the ground and sky in the same way. On the contrary, it would provide a basis for assuming that the perception of the ground and sky will be in large measure determined by the motives, needs, and schemata which each perceiver brings to the ground-sky situation. For individuals coming from the same culture or subculture and possessing similar backgrounds there will be a substantial amount of agreement with regard to the schema which they utilize in a given situation, but individuals coming from different cultures or subcultures may perceive in basically different ways.

Vernon's book not only presents a theory but systematically reviews the very considerable experimental literature supporting it.

The initial chapters are concerned with a statement of the nature of perception and a description of the basic aspects of the perceptual process and its development. In the discussion of this last topic, this reviewer found some important omissions—physiognomic perception, for example. In this primitive form of perception the individual does not clearly distinguish between the self and the not-self, and tends to perceive the environment as having dynamic qualities. It is reflected in our metaphorical language and, according to Werner,[3] predominately characterizes the perception of children, primitives, and brain-damaged individuals. It also furnishes evidence of the extent to which motor and affective factors operate in the perceptual process. Vernon's discussion of the whole genetic problem, including her concern with the role of mental imagery, was, for this reviewer, the least

[3] Werner, H. *Comparative Psychology of Mental Development.* (Revised Ed.) Chicago: Follett Publishing Company, 1948.

satisfactory portion of her book. A careful consideration not only of Werner's work but of certain theoretical articles by Gardner Murphy[4] would have clarified and supported her theoretical position.

The perception of form and space are fundamental ("a formless percept is unthinkable") and chapters four and five critically review the relevant literature. The so-called "constancies"—the tendency to perceive objects as possessing, within wide limits, an unchanging identity even though on the basis of independent evidence we "know" these objects as stimuli vary greatly in shape, size, color, and brightness—are studied in detail in chapter six. It is here, incidentally, that we find important evidence that the perceived object is not a photographic copy of the stimulus object. Chapters seven, eight, and nine are concerned with certain special problems in perception including the perception of "real" and "apparent" movement and Michotte's studies of the perception of causality.

It is in chapter ten that Vernon turns her attention to the central problem of the contribution of the perceiver to the perceptual outcome. In some fifty pages—approximately a fifth of the book—she assays the data regarding those aspects of the perceptual process which are peculiar to the perceiver. The topics include the phenomena of attention, the influence of "set" and "aufgabe," and the role of motivational and attitudinal factors. In a sense this is the heart of the book, and certainly, at least for his reviewer, its most important as well as interesting part.

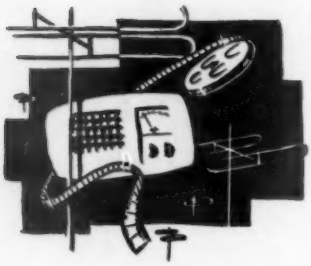
In an appendix the author takes cognizance of Gibson's point of view as expressed in his recent book. She believes that he, on the general ground that the perceptions of different individuals are, in fact, similar, minimizes the data which support the hypothesis that there are individual meanings built up in the course of experience. However, she readily agrees that these schemata may be broadly similar for different individuals. "No one would deny," she states, "that, in a general way and over a long period of time, experiences of shape, size, colour, distance, movement, etc., are much the same for everyone. They are also reasonably accurate whenever we can check their accuracy." But, she continues, "individual differences do occur when careful and analytical discrimination are required, since usually different individuals have had different amounts and types of training and experiences in making such analyses. They also have had different experiences in the schematic categorization of personal data, and hence they attribute different amounts and types of meaning to them."

[4] Murphy, G. and Hochberg, J. "Perceptual Development: Some Tentative Hypotheses." *Psychological Review* 58: 332-349; 1951.

This is, indeed, a mild rebuttal. As Professor Gibson stated in this journal in his reply to Dr. Norberg's review of *The Perception of the Visual World* and a second book which presents a view of the perceptual process in many ways similar to that of Vernon, "The basic assumptions of the two theories are about as contradictory as assumptions can be." The fact that there are similarities in the schemata used by different individuals with similar types of experiences—similarities which can be the basis for reliable predictions of overt behavior—should not obscure the fact that these categories of meaning are *learned* and hence peculiar to each individual. Gibson in his book somewhat grudgingly seems to be saying this when he notes[5] that the Trobrianders, as a function of their beliefs regarding kinship, always perceive the child as resembling the father. Such facts as these, he says, "seem to point to the general conclusion that each man learns the meaning of the world for himself, within the framework of his upbringing and the society in which he lives. Significance and value are formed partly by cultural background and partly by the individual's unique experience, but in any event are learned." He then refers to the phenomena of instinct as described by McDougall as affording an exception to the hypothesis that all meanings are learned. Further he suggests that much of the evidence for the schematic (action and purpose) theory of perception is based on experimental conditions in which the stimulation is "impoverished, ambiguous or equivocal," although in everyday living such conditions may frequently obtain.

While we may grant the reality of the facts of "literal" perception and their importance even for the student of audio-visual processes and communication—the practitioners in these areas will find *The Perception of the Visual World* extremely useful—for this reviewer the research data and theory of the type presented in Vernon's book provides the necessary, perhaps the only, psychological basis for understanding the extraordinary complex processes occurring in the communication situation. The researches of social psychologists in recent years as reviewed by Vernon have shown how the need-value-belief systems of the individual fundamentally determines how he perceives the content of a communication. These findings enable us to understand in part, for example, such puzzling phenomena as the diverse and catastrophic reactions to the famous *Invasion From Mars* radio broadcast, or within limits, to predict the "effects" of a specific educational film.

[5] *Op. cit.* p. 206.



FILM REVIEWS

•ROBERT W. WAGNER

MOTION PICTURE PRODUCTION IN UNIVERSITIES AND COLLEGES

Today, the production of motion pictures is becoming an indigenous part of the teaching, research, and public relations functions of most universities and colleges in the United States. Such production reflects, in part, the expansion of functions going on in most institutions of higher learning, and in part the development of what may well be a significant chapter in the history of the motion picture in America.

The vast intellectual, artistic, and technical resources of the university theoretically make possible motion pictures of depth and scholarship which cannot be paralleled by any other film production organization. For this reason, the university has been described as the natural home of the information and documentary film.[1] It would also seem to be the natural home of the research film, the experimental film, the film which, if not produced by a university, may not be produced at all.

What, then, is the history of university film production? What kinds of pictures are being produced? How have these productions served higher education?

Early university-produced films were silent visual recordings made, for example, by a botanist interested in the possibilities of time-lapse photography; by an engineer who wanted to study high-speed phenomena in slow motion; by football coaches who were recording their victories and defeats on motion picture film as early as 1918.[2]

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[1] Kaufman, Sidney. "The University And The Film," *Film News*, 7:1-2, 1946.

[2] It is interesting to recall that the University of Pennsylvania once employed Eadweard Muybridge, one of the godfathers of the motion picture, who conducted some of his historic research in the photography of motion at the university as early as 1885.

Even before the advent of 16mm film, in 1923, motion pictures of various types had probably been produced by at least a dozen universities, including Michigan, Nebraska, Ohio State, and Illinois.

A few institutions early became associated with film production projects of major importance. The Chronicles of America will be remembered as a widely used series of historical films produced by the Yale University Press in the late twenties. A number of the first Erpi Classroom Films were produced in collaboration with educational advisors from the University of Chicago. Willard Van Dyke produced the well-known documentaries, *And So They Live*, and *Children Must Learn*, for the Educational Film Institute of New York University, with Sloan Foundation support.[3]

University film production, scattered and sporadic before World War II, entered a new phase following its end. The handful of writers, directors, and cameramen who returned to the universities were ambitious, sincerely interested in film-making on the nontheatrical level, and possessed of a variety of skills and techniques learned in armed forces or government film production programs during the war. Although professional 16mm cameras, sound recording systems, and processing laboratories had been gradually acquired by a few of the larger universities, the typical university film worker still found it necessary to improvise much of his equipment, to perform every job from script-writing to set-building, and to make films on extremely limited budgets.

The efforts of the university film-maker, however, were supported by the growing strength of the whole audio-visual education movement, encouraged by the expansion of university film libraries, and stimulated by the demand, on the part of instructional and research staffs, for more films on more subjects than ever before.

Common problems and the desire for a professional approach to university film-making led to the formation in 1946, of the University Film Producers Association. Today, this organization has an institutional membership of nearly 50 leading colleges and universities in the United States and Canada. The total individual membership is approximately 200, including associate and sustaining memberships held by a number of educational and commercial film producers. The UFPA holds an annual convention, and publishes a quarterly journal, dealing with many phases of communication by motion pictures and allied media.[4]

[3] An ambitious 35mm film production program was begun at the University of Minnesota in the early thirties, although the project was prematurely discontinued.

[4] The *Journal of the University Film Producers Association* is distributed free to all active, institutional, associate, and sustaining members of the UFPA. Subscription to nonmembers is $2.00 per year. Editor: John Mercer, Radio-Television-Film, State University of Iowa, Iowa City.

University film production units today consist of from one to as many as twenty film production specialists. Although many of these people are on the academic level salarywise, most do not yet have faculty rank. In some cases, as at the University of Southern California, and Indiana University, student assistance is also heavily relied on, with the university production program and the film-training program being closely related.

The production units themselves are found in a variety of organizational patterns. A survey of nearly 100 film-makers in more than 50 colleges and universities shows that 44 of these people are making films as members of the staffs of audio-visual centers, departments, or services; 14 are employed by photographic divisions, departments, or centers; 11 are part of a TV, motion picture, or communications center, department, or division. The remainder are scattered in departments of drama, fine arts, public relations, and miscellaneous organizational setups.

Film production is generally financed in one of three ways, or in combinations of these: (a) revolving funds derived from the sale of prints; (b) direct or indirect payments to the university for film production by state agencies, foundation grants, or other private organizations; (c) university appropriated funds.

Most universities handle their own distribution of prints on a loan, rental, or sale basis. The universities of Southern California and Wisconsin, have also made arrangements with McGraw-Hill Text-Films for the distribution of one or more pictures. Encyclopaedia Britannica Films is distributing prints for the University of Minnesota. The distribution facilities of the Educational Film Library Association are also available to the university film producer, and the unique services of the Psychological Cinema Register at the Pennsylvania State College are open to the producer of the psychological, psychiatric, and mental health film. The Fund for Adult Education, through the Educational Television and Radio Center at Ann Arbor, has undertaken the analysis of hundreds of nontheatrical films for their possible use in educational television.

How to make the university-produced film more widely available, and how to interchange films for classroom and for educational television, is part of the knotty problem of how to get good educational films of all types into the main current of American education.

Sports, public relations pictures, surgical operations, high-speed, time-lapse, photomicrographic, and other technical film studies continue to fill a large part of the schedules of most production groups. But the variety and treatments of the subjects being produced, in addition to the above, is increasing. Here, for example, are the titles of some of the university-produced films recently

shown at the Golden Reel Film Festival sponsored by the Film Council of America:

The Rime of the Ancient Mariner (University of California at Los Angeles); *A Study of Vocal Cord Abnormalities* (Minnesota); *Art, Dry Paper Modeling* (Oklahoma); *Flood* (Iowa State College); *Mastitis Can Be Controlled* (Wisconsin); *Rice Farming in Japan* (University of Michigan); *Procedures in the Diagnosis of Cardio-Vascular Diseases* (University of Southern California); *The Legislative Process* (Indiana); *Rotary Drilling Fluids* (Texas); *Beauty In Stone* (Wayne University).

New technical and topical standards are being set for the university-made film. What, then, about objectives? What are university-produced films really for? What unique contribution can they make to the institution of higher learning?

First, the university-produced film can help the college instructor do a better job of teaching.

The university-produced film, *The Development of a Frog,* for example, has become as much a part of the course in freshman zoology, comparative embryology, and vertebrate zoology at The Ohio State University as required readings, experiments, and field trips. The film is important because it was designed specifically for the college level, and because it does something which cannot be done by the spoken or printed word alone. As the Harvard Report puts it:

> The challenge to the text is given when the screen ceases to be a mere illustration or adornment to the language and becomes the equal or superior medium of communication . . . . In the making of a good instructional or documentary film the duties of language are searchingly looked into and the needless obscurities of traditional texts are explored. A healthy criticism is started and language, gaining a rival in its new partner, has now new standards of lucidity to live up to.[5]

To Mark Van Doren's comment that "great books as well as men may qualify as teachers,"[6] we must also add the film which can "set new standards of lucidity" in the teaching of many subjects at the college level.

The university-produced film can also effectively help to meet the challenge of increased enrollment. One university registrar, on the basis of a careful study, predicts that "barring some unprecedented national disaster, there will be by the year 1970 almost twice the number of young people in college age in the United States than there are at this time," and that as a result, "universities will

[5] *General Education in a Free Society.* Report of the Harvard Committee. Cambridge: Harvard University Press, 1945, p. 263.

[6] Van Doren, Mark. "The Arts of Teaching and Being Taught," *Unseen Harvests,* C. M. Fuess and E. S. Basford, editors, New York: Macmillan Co., 1947, p. 239.

soon be faced with problems of such magnitude that there is no precedent for their solution."[7]

Unless the existing scarcity of suitable films and other audio-visual teaching devices at the college level is remedied now, institutions of higher learning may find themselves ill-equipped to meet the challenge of mass education in the near future.

Second, the university-produced film can assist in the discovery and exploration of new knowledge. The 16mm camera has materially assisted in enlarging our understanding of the physical world. University-produced films have been made on the digestive system of the cow, on what makes tire chains break, how the human vocal cords perform in action, what causes metals to corrode, and on hundreds of other scientific and experimental subjects.

Equally important, however, is the use of motion pictures for research in the social sciences, for the study of human behavior, and for extending our fundamental knowledge in the fields of sociology, economics, psychology, and political science. Here is the field for the documentary, the searching film portrayal which grows from a detailed study of human affairs. Few university productions deal with the kinds of issues which make good documentaries. Yet, one of the major functions that a university film production program could serve, is to revitalize the documentary movement in the United States through the production of films based on thoughtful, objective research on the problems of our times.

Film research can also contribute to our understanding of the processes involved in human communication itself. Extensive testing in this connection is going on in the Instructional Film Research Program at the Pennsylvania State University, and in the Human Research Laboratories at the George Washington University. In the course of such film research, we may eventually learn not only how to make better films, but also much about the symbolic world in which we live.

Research and production, then, should go hand in hand in a university film program which includes the development of documentary films designed to attack unsolved problems in the social as well as the physical sciences, and the production of experimental films designed to explore the problems of human communication.

Third, the university-produced film can be the means by which the student learns the art and science of audio-visual communication. This must be more than mere vocational training. The teaching program should include not only the techniques of camerawork, editing, sound recording, and film processing, but also the relationships of music, the theater-arts, and television to the medium of

[7] Thompson, Ronald B. "College Age Population Trends, 1940-1970," *College and University,* Jan., 1954, pp. 219-223.

the motion picture. In addition, the student should develop a background of the basic understandings in communication, perception, social psychology, and education. The mature film has never been the product of shallow minds. It can only be realized by the film maker with a rich background of experience derived both from books and from life itself.

Jean Renoir, speaking to students of cinema at the University of Southern California, once pointed out that perhaps never again would they have a chance to experiment so freely with film as during their student days. Certainly, the student-produced university film should be the product of an experimental approach, should cut across subject matter lines, have as its primary objective and its only obligation the enlightenment and enrichment of those who participate in the making of it.

The production and use of films can be a common denominator of many arts and sciences, but few universities, with the exception of Indiana, Southern California, U.C.L.A., and possibly one or two others have yet developed a comprehensive curriculum built around motion picture production.

Fourth, the university-produced film can be the vehicle through which significant information and mature concepts may be made available to specific audiences in the community which the university serves.

Through an expansion of distribution systems, including the transmission of films by means of educational television, the university may increase its effectiveness in a period which may well be the beginning of what has been called a "tidal wave of mass culture." In such a period, the modern concept of a university "press" will have to include a richer outpouring not only of texts and pamphlets, but also of motion pictures, filmstrips, slides, recordings, and other materials designed for large audiences.

A new concept of the university "public relations" film must come into being. A number of good promotional films have been made by colleges and universities—*Campus Frontiers* (Antioch), *Princeton* (Princeton), *One Brick Higher* (Purdue), *Widening Circles* (Michigan State). But it may well be that in the end the best public relations films are really good instructional films, the thoughtful documentary, and other productions of such intellectual and artistic stature that they command attention and respect wherever they are shown.

The free, inquisitive, critical spirit and the disciplined scholarship upon which a university is founded should be reflected in every university-produced film, whether it is to be shown inside the college classroom, to the local PTA, or at a Rotary Club luncheon. This does not mean that such films must be pedantic, dull, or un-

inspiring. They can and should be interesting, provocative, and stimulating, provided they are at the same time honest, thoughtful, mature in their outlook, and dedicated to the promotion of ideas worthy of an institution of higher learning.

Fifth, the university-produced film may actually help clarify the objectives of the university itself.

The philosophy and purposes of a university come sharply to focus in the university-produced film. The process of motion picture making itself requires that generalities be reduced to specifics, that abstract concepts be made clear, that conflicting points of view be frankly presented, and that the content and methods of the teaching program be clearly understood so they may be restated on celluloid.

A few years ago, The Ohio State University produced a film, titled *Accent On Learning*, intended to promote more effective use of audio-visual methods of instruction on the college level. It would be hard to assess the effect of such a film on the thinking of college teachers and administrators who have seen it. But time and again, university film producers tell how the attitudes of faculty members have been changed during the course of film production itself. This, at least, was true of *Accent On Learning*, and there is little doubt that the members of the faculty who participated in the making of it were more aware of their teaching responsibilities at the end of the production than at the beginning of it.

The five functions of the university-produced film described above are related to what the writer considers to be the central purpose of a university. For if it is to serve a unique function, the university-produced film must first of all serve the university, contribute to the fulfillment of its objectives, and convey something of its spirit and its future.

A university film production program should serve to fill the gaps left by commercial film production. It should be based on quality, rather than on quantity, concerned primarily with the promotion of ideas rather than the promotion of print sales. Such strategic production must be increasingly supported by the university itself, as a means of improving the level of instruction, as a tool of basic research, as a focal point for the education of students of the mass media, and as a means by which advanced knowledge and mature concepts may be communicated to a growing population of adults both on and off the campus.

Only in this way can a university film production unit distinguish itself, only in this way can its limited resources be put to the most strategic use, and only in this way can the thoughtfully designed university film help shape as well as serve the ends of higher education.

WORLD COMMUNICATIONS

•GERALD F. WINFIELD

MOVING KNOWLEDGE AROUND THE WORLD

The Foreign Operations Administration has technical cooperation[1] programs in about forty underdeveloped countries in Latin America, Africa, the Near and Far East. In these countries some nine hundred million people live.

One of the characteristics of underdevelopment is the lack of modern knowledge of all types—general, technological, public administration, how to organize and manage group life, literacy.

These countries not only have a huge population—almost half the people of the earth—but they occupy a vast area of thirteen million square miles. Among them are some of the most densely populated areas of the world. In many parts of Latin America and Middle East population is sparce and widely scattered.

Between 60 and 90 percent of the people are illiterate.

The essence of technical cooperation is to provide the means by which the 50 to 100 years' lag in total development, which is characteristic of these countries, may be quickly made up and such basic objectives as adequate food, rising productivity, improved health, and advancing skills in education and technology may be achieved. For this purpose FOA-supported programs, which in every case are joint efforts requested specifically by the countries concerned, are designed to assist with the solution of fundamental problems in a great variety of ways.

In any country there are from a few to several score projects that may range from replanting the cedars on the hills of Lebanon to building a dam in the Helmand Valley of Afghanistan to bring thousands of acres of nonproductive land under irrigation. These

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[1] Popularly known as Point Four.

projects include more than thirty contracts with American universities to supply assistance to educational and community institutions. One of the most successful of these is the contract under which Oklahoma A & M College is assisting the establishment of a brand new agricultural college and a number of agricultural secondary schools in Ethiopia.

Among outstanding agricultural projects are those for the introduction of the Japanese method of rice culture into India, for the development of improved seed and the upbreeding of livestock in many countries, for the control of insects and combating age-old scourges like the locust plagues of the Middle East, for introducing and developing 4-H clubs, and for developing whole systems of agricultural extension in a score of countries.

In health there are programs for malaria control, which are rapidly bringing the earth's most deadly and widespread disease under control. Other projects include environmental sanitation, the introduction of improved water supplies for cities and villages, the development of rural health centers and clinics, assistance to medical schools in the training of doctors, nurses, and other health personnel, and many others.

In education there are scores of projects which range across the field of adult education, technical and engineering training and development, the training of artisans in technological schools, and the assisting of more advanced institutions of many types.

The process of increasing the industrial output of these countries is assisted through the provision of consulting engineering services for the study and planning of industrial development, by productivity projects to increase the efficiency of existing enterprises, and by efforts to improve transportation and communications.

To carry out the American technical part of this vast range of varying programs, FOA provides almost 2000 technicians in all fields who work with nationals of the various countries to develop and carry forward the technical cooperation program.

The essence of many of these programs is to communicate rapidly new knowledge and skills and to remotivate people so that they will change fundamental life habits, substituting improved methods for those which they have followed for hundreds, perhaps thousands of years. At best, there is only one American technician, on the average, to every half million people among the vast population with which FOA works. Yet, to be ultimately effective, the changes in knowledge and practice which are being introduced must reach and affect the lives of millions of people. This means an enormously complex and important social communications problem.

This communication has to take place not only through time and space to reach huge numbers of people, but through barriers of language, and, most important of all, through patterns of cultural difference that are enormously significant when motivating people to action is required. Finally, communication must take place over the barrier of illiteracy. Not only a large proportion of the people it is necessary to reach are illiterate, but in many cases languages are so complex it is difficult to teach people how to read and write. This is particularly true of the Arabic countries. It is imperative, therefore, for these underdeveloped countries around the world to learn new methods by which to communicate knowledge to their people despite these many barriers. Time is short—new knowledge must move rapidly.

One evening two years ago I was standing with my small son at the foot of the Shwe Dagon pagoda in Rangoon, Burma. Spread before us in a huge grass-covered area was a pagoda fair thronged by thousands and thousands of curious pilgrims and townspeople. Immediately in front was a temporary pavilion in which hundreds of people were gazing intently at a photo and real-object exhibit of the programs and activities which the Burmese Government was carrying forward with FOA assistance. My small son stood beside me, watching the great eagerness with which the crowds poured through the exhibit, and gathered to see the evening's movie show. Then he turned and looked up to me and said, "Dad, you don't have to teach them how to look, do you?"

No, we don't have to teach people how to look. Across the underdeveloped parts of the world, millions of people are eager to look. Life in their villages is not very exciting. They have a great deal of time. They have enormous curiosity. They are eager to look at the modern world and at new ways of living and doing.

Therefore, the graphic, the image, audio-visuals are the method par excellence for solving this problem of communicating new knowledge to peoples in the underdeveloped areas.

While you do not have to teach people how to look, frequently you do have to teach them how to see. Seeing very largely is a matter of being able to look at information that is within the cultural pattern, the graphic idiom, and the spoken language which the people understand. It is imperative that you get within their area of vital interest and speak in a language, either graphic, oral, or written, which they are able to interpret for their lives.

Just as it is the basic purpose of all technical cooperation to train people, supply necessary equipment, and help bring into being organizations to deal with health, agricultural, educational, and industrialization problems within the countries in such a way that American cooperation may be successfully withdrawn or

transferred to other activity, so in the field of audio-visual method and mass communications it is the purpose of the FOA program to develop the capacity of the countries themselves to solve their communications problems.

The social communications problems of an underdeveloped country comprise a vast array of interrelated matters. In most cases the fundamental media of papers, magazines, and radio are only partially developed. In the typical underdeveloped country these regular media of communication reach only one or two percent of the population. Even such fundamental matters as telephone and telegraph communications to the villages of the Middle or Far East are largely lacking, with only a small fraction of all villages connected with the capital or the outside world by any physical means for the transmission of even the most common news and information.

The new or underdeveloped governments of these countries still for the most part do not understand the relationship that exists between the movement of knowledge and the solution of local and national problems. While many of them may be aware of the role that propaganda plays in political life, typically they are still largely indifferent to the kind of effect which has been exerted in advanced countries by systems of mass communication which make scientific and technical knowledge the common daily property of all classes of people within the country. It is the objective of FOA's audio-visual communication programs to awaken these countries to their needs in this field and to cooperate with them in training the personnel, developing the organizations, and supplying the fundamental equipment required for them to tackle and solve their social communications problems.

How is this done?

The patterns of activity vary from country to country. One of the outstanding programs is that in Iran, where Syracuse University is carrying out a contract that provides most of the services of the audio-visual program. This work began as a modest effort to produce a group of specifically needed how-to-do-it motion pictures. From that it has steadily grown into a motion picture production program which has already produced almost 50 titles, a production training program which is teaching 40 young Iranians the skills and crafts of motion picture making, and another 15 in the production and use of filmstrips. It has developed a nation-wide network of centers which provide close informational and communications support for the Iranian and American technicians who are tackling and solving many problems in Iranian villages. It includes an audio-visual utilization program that is

training 6000 Iranian teachers how to use audio-visual aids to improve their school programs.

A typical result of the introduction of films tailor-made within the country to meet the cultural, psychological, and specific needs of a program for social communication, is that of the child care health program in Iran.

Five-man child-health instructional teams operate in various parts of Iran working with mothers in villages. Their purpose is to give the mothers a four- or five-day period of intensive instruction and demonstration in improved methods of personal hygiene, nutrition, and other aspects of adequate child care. Before they had a movie for opening up and illustrating the problems of child care, it normally took from two to three days after the team arrived in a village to attract and persuade a large percentage of the women to attend the classes of instruction.

After the team was equipped with a projector, a generator, and a properly produced film, this time lag disappeared. Now the team moves into a village in midafternoon, makes its necessary formal calls and contacts with the headmen of the village, and announces a movie show for the evening. The show opens with one or two pictures of general interest, including some newsreel and cartoon material, and ends with the carefully done presentation of the problems of child care. Because of the enormous interest in movies as such, every member of the village, men, women, and children, is on hand when the movie begins. It is simple for the skilled Iranian members of the health team to open up a discussion of the problems of child care following the final picture in the program. As a result of the interest generated through the movie, the next morning most of the women of the village are on hand when the team starts its program of intensive instruction and demonstration in child care methods. In time saved in the health teams alone, the films already have paid for themselves several times over.

The key necessity for the most effective use of films in social communication at the village and mass level is that they be produced in the country or very radically adapted to the needs of the country. This adaptation includes, in most cases, more than putting on a sound track in the language of the country. It has been found, for example, that the level of communication of films shot in western countries, paced for western audiences, motivated by western concepts of human behavior, usually is not high among the peoples of the East. On the other hand, films that are shot within a country and designed to meet the psychological and cultural needs of a particular program can be extremely effective.

However, in its programs around the world FOA is not giving sole or even primary emphasis to movies as the only audio-visual medium. Great emphasis is placed on the simpler and less expensive media. In many countries slides and filmstrips are being used extensively and effectively. Silk-screen printing has been introduced in more than a dozen countries and is being effectively used in the production of colored posters, turnover talks, and other large-page-size printed materials of a graphic nature.

A steady stream of highly illustrated bulletins on health, agriculture, education, and the skills of industrial life is being produced by ministries of agriculture, health, education, industrial development, in countries and states throughout the whole underdeveloped world. These publications are frequently of the cartoon type. Such a series is the group of little pamphlets which are going out to the teachers of Thailand.

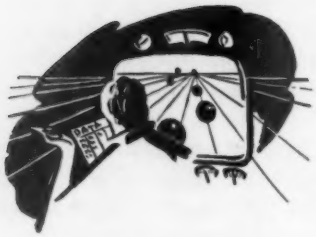
Thailand has 25,000 rural teachers who preside over one-, two-, and three-teacher schools scattered throughout the villages of the land. Most of these teachers have had four or five grades of education themselves and are responsible to teach through the fourth grade. Naturally their own range of knowledge and teaching skill is limited. From the Ministry of Education there go to these teachers at regular intervals cartoon-type booklets which deal with specific teaching techniques or a type of educational information which the teachers are needing at the time. By this method, because it is largely graphic, because it is carefully worked out, because it is applied in small, easily understood and easily assimilated doses, the teaching capacities of the teachers of Thailand are being steadily improved. Thus, the next group of young people who finish the fourth grade will know more and be better able to move their country and its programs forward than those who have gone before.

Through technical cooperation supplied by FOA still picture darkrooms, art departments, silk-screen printing plants, and motion picture production centers, have been established in many of the underdeveloped countries. In a few cases fairly extensive laboratories for sound and film processing have been built. Libraries of audio-visual material have been established and loan centers for the equipment and materials for use in schools and communities have been organized. At the center of these activities of planning, organization, production, training, and utilization are American audio-visual specialists who have been recruited from institutions of learning, from industry, from newspapers and magazines. They work with nationals to help produce and use the tools of modern audio-visual communication to rapidly move vast ranges of new knowledge into the minds and living ways of

common people in these countries. In these programs we emphasize to ourselves and to our national colleagues that communications are important means, that communications in and of themselves are not ends, that they must be the vehicles by which useful knowledge capable of changing and improving the life of people is conveyed. Central to all these efforts, which are carefully coordinated with similar work by UN and other agencies, is the effort to train nationals to do all those things that American audio-visual specialists now do.

There is no other task that is more important nor more significant for the life of our generation than the task of bringing these underdeveloped areas of the world abreast of the more developed countries. As this process is successfully carried out, social and political tensions can be reduced. If the vast array of new knowledge in health, in agriculture, in education, in industrial development which has become the property of the human race within the last fifty years can be effectively applied to the whole global environment, then we have the hope of creating a peaceful world community in which all of us and our children may live in growing security and at improving levels of well-being.

This is the fundamental task of international communication.



RESEARCH ABSTRACTS

TELEVISION

JACKSON, ROBERT. "Visual Principles for Training by Television." *Human Engineering Report SDC 20-TV-2. Navy Special Devices Center, Port Washington, L. I., N. Y. 26 pages. Undated.*

Purpose: The quality of the picture of a training device reproduced on the TV receiver is important to effective training by television. This study was designed to answer two questions concerning this subject: (a) Do the visual characteristics of a training device make an important difference in TV visibility? (b) If so, what are the visual principles involved?

Procedure: One hundred and five devices were rated for visibility when viewed on a television screen. Visibility of the devices was estimated by a panel using rating scales covering the various points of TV visibility. All factors except the devices were held as constant as possible by using the same TV equipment, lighting and technicians, by using the same instructor, and by using the same rating panel. After the devices were rated, the 25 percent rated best on visibility were compared with the 25 percent rated worst on visibility. Bringing the best and worst devices together pointed up regularities within each group, and differences between groups. As impressions were formed of these regularities and differences, they were put down in tentative form as principles. For example, 24 of the best devices had a light figure on a dark background. None of the worst devices had such a characteristic. Thus, a light figure on a dark background was considered to be an important finding. After principles were set down, they were checked as follows: (a) By revising three of the worst devices and retesting. (b) By making a new device embodying all of the principles. (c) By predicting the ratings for additional devices rated.

Results: The visual characteristics of a training device do make an important difference in TV visibility, regardless of how well TV equipment and personnel perform. Thirty-one principles were found which affect the visibility of training devices seen on TV. Typical principles are: "(1) The figure (the principal part to be seen) should be organized in a horizontal movement from left to right." "(4) Vertical organization should be avoided." "(10) Dull light grey tones against dull dark greys give the best contrast."

"(22) The height of letters and numbers should be approximately height-of-device ÷ 15." The checks used on the principles indicated that the principles were correct. The revised devices were much improved in visibility, the new devices embodying all the principles rated "excellent," and there was a high correlation between predicted ratings and actual ratings.

Discussion: Practical limitations may make it impossible to apply all of the thirty-one principles reported. In such cases, as many should be followed as possible. It can be predicted that the more these principles are applied, the better will be TV visibility.—*E. G. Sherburne, Jr.*

JACKSON, ROBERT. "Learning from Kinescopes and Films." *Technical Report SDC-20-TV-1. Navy Special Devices Center, Port Washington, L. I., N. Y. 15 pages. April 1952.*

Purpose: To discover why kinescope recordings, shown as motion pictures in the classroom, were doing such a good job in military training in spite of their obvious limitations in technical quality. The question was raised as to whether kinescopes, simply because they are kinescopes, arouse a special interest and readiness on the part of the viewer to learn. From this general question, two specific questions were asked: (1) Would learning by kinescope be less if the kinescope were described as a standard training film? (2) Would learning by standard training film be better if the film were described as a kinescope?

Procedure: The experiment was designed to evaluate the learning of four pairs of matched groups of trainees. Learning was estimated by administering pre- and post-tests. The important variable in the experiment was what the groups were told they were looking at (a kinescope recording or a standard training film). This was done as follows with the pairs of matched groups: (1) First Pair: One group saw a kine which was described to them as a kinescope. The other group saw the *same* kine which was described to them as a training film. (2) Second Pair: One group saw a standard training film which was described to them as a kine. The other group saw the *same* standard training film which was described to them as a standard film. (3) Third Pair: One group saw the standard training film which was described to them as a kine. The other group saw the *same* standard training film *in color* which was described to them as a standard training film. (4) Fourth Pair: One group saw the standard training film which was described to them as a kine. The other group saw the *same* standard training film *in color* which was described to them as a kine.

Results: (1) First Pair: The group which was told they were looking at a kine *learned more* than the group which was told they were looking at a standard training film (kine used in both instances). (2) Second Pair: The group which was told they were looking at a kine *learned more* than the group which was told they were looking at a standard training film (standard training film used in both instances). (3) Third Pair: The group which was told they were looking at a kine *learned more* than the group which was told they were looking at a standard training film *in color* (standard training film used, one version in color). (4) Fourth Pair: The group which was told they were looking at a kine *learned about the same* as the group which was told they were looking at a kine *in color* (standard training film used, one version in color).

Conclusions: The two most important conclusions are: (1) When a kinescope or a standard training film is described as a kinescope, learning

increases significantly. (2) The superior learning resulting from describing a film as a kinescope occurs whether or not the presentation is in color.

Discussion: No interpretation should be drawn from these results that standard training films should be called kinescopes to improve learning. Three possible explanations are offered to account for the results of this experiment: (1) The novelty of kines, associated with television, may create a greater readiness to learn. (2) The effect of immediacy or recency, carried over from TV, may increase the trainees' readiness to learn. (3) The results might be due to cultural characteristics of Americans, in that kines represent progress, and are therefore more acceptable than films.—*E. G. Sherburne, Jr.*

READABILITY

UNIVERSITY OF ILLINOIS, DIVISION OF COMMUNICATIONS. What Makes For Readable Writing and Reading Success. *Human Resources Research Institute Research Memo # 10, Maxwell AFB, Alabama, July 1953.*

Purpose: "Writers and editors wish to know—What printed material best succeeds in carrying knowledge to man?"

Procedure: This report is primarily a survey of the literature on readability and includes abstracts of all references cited.

Results: Readability measures, for the most part, classify writing on two principal parameters: an easy-difficult ladder, and an interesting-dull ladder. The elements in the easy-difficult ladder are divided into such things as: vocabulary difficulty, length of words, length and complexity of sentence, and difficulty related to parts of speech. For the interesting-dull classification the following criteria are generally used: references to people, number of verbs vs. number of adjectives, number of image-bearing words and human-interest words, and localisms and words learned early in life.

The Dale-Chall and the Flesch readability formulas appear most efficient in discriminating between less and more readable materials.

Almost without exception, the readability formulas deal with stylistic qualities of prose rather than with its meaning. The results of such tests may serve as an aid to the judgment of an editor or writer, but an important part of the qualities which make writing readable are not measured by these formulas. This is the area of "content readability." The readability formulas do not serve as a substitute for the judgment of a talented writer or a competent editor. Such men deal mostly with the content aspect of readability which formulas hardly touch.—*Edmund Faison.*

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